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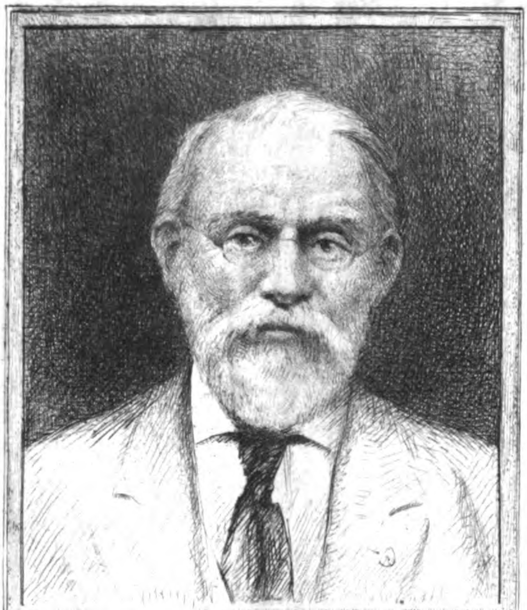
United Service Institution of India



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JOURNAL

OF THE

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AUTHORS ALONE ARE RESPONSIBLE FOR THE CONTENTS OF THEIR RESPECTIVE PAPERS.

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The Journal
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VOL. XXV. 1896 No. 123.

THE SYSTEM OF ARMY TRAINING OF GENERAL DRAGOMIROW OF THE RUSSIAN ARMY.

By Major TONNOCHY, 4th Sikhs.

The Russian soldier has a proverb "It is jollier to die in company and little mother Russia has sons enough," on which one Drigalski has remarked "this feeling, namely the indifference to danger arising from a certain want of intelligence, though accompanied by undoubted heroism, will be probably in the future as it has been in the past, the strong point of the Russian infantry."

This want of initiative yet possession of quiet uncomplaining courage in the discharge of duty, must be remembered when considering the system of training adopted by a Russian. National characteristics show up no where so much as in war, and a leader is wise who remembers them.

Dragomirow commanded the 14th Russian Division which led the way at the passage of the Danube in the Russo-Turkish War, and distinguished himself at the Shipka Pass. He now commands the military district of Kieff, and, according to Captain von Mach of the 4th Magdeburg Infantry Regiment whose paper in the Neue Militärische Blätter for October 1895, I wish here to bring to notice and discuss—he would in case of war be appointed to take chief command against Austria, if not selected as Chief of the Staff to the whole Russian army. In peace the General has under his orders 4 army corps, 5 cavalry divisions, 1 brigade of rifles, and 1 of reserve infantry. It is evident therefore, that his views must have great weight and influence. He is the author of several military works, one of which is the basis of Captain von Mach's article.

From this article which I think of great interest as giving not only a Russian but a Prussian view of the subject, I must quote largely. "Dragomirow's system of training" says the writer "is based on that of the Great Suwarow. 'Suwarow' taught his troops in such a way that they came on nothing new in the day of battle, and attacked with cold steel with the same earnestness they had shown at manœuvres. The youngest soldier of those falling within the sphere of his influence knew war-craft both practically and theoretically better than it is known at present in any European army even the most highly trained.

When hehad clearly recognized that, for victory, it is needful to strengthen the soldier intellectually, morally, and physically, Suwarow, as a direct consequence, brought his system of education in absolute harmony with these objects. The development of the power of apprehension, and especially of resoluteness of character; the blunting of the instinct of self preservation so far as that is to be attained in a living being; the strengthening of the intelligence of the lowest soldier in the principles of war-craft; that was Suwarow's system in all its simple and comprehensible sublimity. For his soldier there was nothing unexpected in the fight, since he had already in peace-time been tested in the most difficult impressions that battle was able to produce. When however, a man is so educated that nothing can astonish and upset him, when he knows in addition what he has to do in his own humble sphere of activity, then he cannot be conquered then he must conquer."

In his work, Dragomirow separates, Education from Training. He attributes great value to education, for the success of the training depends on the education of the soldier, that is, in the degree in which he is penetrated with a consciousness of doing his duty.

According to Dragomirow we must watch and shape the heart and head of the soldier before all things.

"The time, writes Dragomirow," "when it was believed possible to influence the heart and head, through the arms and legs, is for ever past, and it is so because it was false to suppose it, as has been proved in a whole list of campaigns. There are indeed still people who think so, as is ever usual in the transition from old to new ideas; but they are gradually yielding their convictions and are compelled day by day, step by step, to accept as true, much which they formerly held as unbearable heresy."

"It is not to be disputed" he continues, "that something does enter the heart and the head through the arms and legs (Dragomirow mean of course the power of habit); but this something in the first place is not effectual for a man who is called to sacrifice his life for his country; in the second place, it has frequently quite unexpected, quite the opposite of the intended, results." Dragomirow probably means that a soldier chiefly drilled and not sufficiently educated for war, does the thing he has practised by habit, but in the presence of unforeseen demands on him he is quite at a loss.

"We should therefore before all things seek to implant in him a soldiers feeling of duty, that is to say, to develope honourably his understanding, to make his heart stout, and the rest comes of itself."

He does not therefore at all consider as useless the teaching to fight, shoot, and march, &c, but simply means "that one is able to instruct at least ten times easier a man penetrated with a feeling of duty and of an honourable mind than one altogether or partially wanting these characteristics," and there he is doubtless quite right.

"We must not forget" says Dragomorow, in the same work, "that it is our vocation to destroy and to be destroyed, and we must not shut our eyes to it."

Later he continues,—

"Thus the soldier must be so educated that he is not afraid to be destroyed but so that at the same time this destruction costs the enemy dear. For this, not only self denial, but intellect too, is required: in war self denial is strengthened chiefly by education, while intellect is developed in a military point of view, chiefly by training."

Dragomirow far from disputing the intimate relation that exists between education and training, admits "that it goes without saying that by a rational management of each, they mutually support one another, because a man educated to sincere obedience can be more easily instructed in all sorts of exercises such as bayonet fighting, firing, and manœuvring; moreover while we exercise him in any of his duties we strengthen him in obedience, and we strengthen him all the more when our demands are practical, that is the more they are of such a kind that it is clear for what purpose they are required. For example, (1) I cause a man to take aim once, twice, twenty times in succession. (2) I make one and the same motion of the Manual Exercise just so, twenty times in succession. In the first case the stupidest soldier understands the object, while in the second (it is the idea of Dragomirow a highly cultivated man) the cleverest does not comprehend why it is necessary. The latter we can cause to become a punishment; but then we must take care that every one takes in that it is a punishment.

"This practical spirit in our demands I too hold" "says von Mach to be of uncommon importance; for every man obeys the more readily the more evident to him is the reasonableness and needfulness of the thing commanded. Now the soldier must certainly obey without testing the quality of the order, that is his views on this point must have no influence on his obedience, but we shall come the nearer to this ideal the more deeply we confirm the soldier, through practice, in the conviction that all that is ordered is good and sensible. The confidence so won will then make him equally zealous in carrying out orders whose object he does not rightly perceive.

The requirement that only what is reasonable be ordered, appears so self evident that many would consider its accentuation superfluous; in reality, however, it is oftener disregarded than one would suppose, and that too by those who ought to know better. For instance such a long standing at "attention" is often required of the soldier that he is directly betrayed into disobedience, that is into secretly standing at ease."

Von Mach then speaks of the injury to discipline of long marches at attention, of long periods in the kneeling position, of refusing the use of water-bottles on hot field days and so forth, which faults with our "march at ease" and "rest" position &c., are not common faults with us I hope. In such cases, as he says, it is better to give the order than to wink at the men doing it themselves, the latter being hurtful while the former is distinctly beneficial to discipline. "If we spare people at the proper moment then we can ask tenfold of them when necessary.

He then says that Dragomirow lays great stress on the fulfilment by the soldier of interior and guard duties, and considers he should be prepared by instruction for all contingencies, examples being quoted for his enlightenment, and a properly regulated system of punishment maintained, by which the instruction is to be enforced. Von Mach next comes to two very interesting matters dealt with by Dragomirow· He says.—

"Before explaining exactly Dragomirow's method of training, I might mention two sorts of exercises of his which should well serve as education for the soldier, inasmuch as they accustom him to the dangers of fire fighting and the close struggle, as far as is possible in peace.

"These are the "Accustoming to Firing" and the "Through Attacks" the former a device of Dragomirow's, the latter derived from Suwarow. The "Accustoming to Firing" is to be used only by the special order of higher authorities, and is not yet introduced into the whole Russian army.

The individual man is to be accustomed to infantry fire, by being placed straight in front of a target against which a marksman at 50 paces fires single shots placed to the right and left of the soldier standing in front of the target. The exercise is to be so arranged as to have the character of a pleasure, as Dragomirow literally expresses it, and not that of a forced duty. [One can imagine a rather sickly smile on the soldier's face till he got accustomed to it.]

The troops are to be accustomed to artillery fire by being exercised in the space between the targets and artillery firing with shell, so that the shots fly over the troops at a dangerous (?) height.

Batteries of artillery in the same way are to be placed opposite each other between two target positions, and then each side is to fire over the other at the targets beyond.

Finally firing practices are to take place of mixed detachments, 1 battalion, 1 squadron, 1 to 2 batteries, against target positions, approaching them in an actual service way, under a settled general idea. In this case too the troops are to be practised in having the artillery shooting over them, and the rearward parties of infantry shooting past them. These last practises are to be introduced *officially* into the whole Russian army.

The "Through Attacks" are to accustom a man to the impressions made by attacking infantry and cavalry, as well as cavalry to that of the proximity of attacked infantry and artillery.

Dragomirow wishes to see these exercises of Suwarow's practised not only after every manœuvre, by which he understands every battle-exercise, but also on the drill ground, and these exercises are also to be introduced officially into the whole Russian army.

In the attack of *infantry against infantry* they are to be placed opposite each other in close order, in line and column, at a distance of 400 paces, and one side thereafter carries out the attack as follows :—

Swift advance to 200 to 250 paces firing volleys. Then a further advance from 100 paces on with beat of drum, from 50 on with arms at the charge. At 20 to 30 paces a hurrah is given, and they pass with weapons uplifted *through* the party opposite them. This party which has fired volleys till the attackers had advanced to within 50 yards, rushes to meet them in the same way with hurrahs. As they meet, the quickest double is required. After passing through them the former attackers continue the movement for 400 paces, in order then to place themselves so as to receive the attack of the former defenders.

The attack of cavalry through infantry (it is noteworthy that Dragomirow knows it also the reverse way), takes place at the same distance. In the former case the infantry files take up at first an interval of 5 paces and the cavalry carries out the movement at a trot. Later the interval between files is to be closed to 3 paces and the attack in half zugs, finally at full speed to ensue. The infantry fires therewith a volley at 200 paces. [Forbes Mitchell in his Reminiscences of the great Mutiny" relates how the 9th Lancers charged the square of the mutinied 41st N. I. "The Lancers charged well up to within about 30 yards when the horses turned off right and left from the solid square. * * * The squadrons were brought round again, and we saw Serjeant-Major May, who was mounted on a powerful untrained horse, dash on the square and leap right into it, followed by the squadron on that side. * * * The horses were thus drilled to turn off and gallop clear of the squares instead of charging home right through the infantry. When it came to actual war, the horses * * naturally acted as on a field day. * * * I am convinced that this is the reason that the untrained remount ridden by Sergt.-Major May charged into the square of the 41st and broke it, while the well drilled horses galloped round its flanks in spite of their riders.]"

"In the *attacks against artillery*, which are also to be specially practised, the infantry and cavalry employ the extended order, the closed portions in rear have to turn towards the covering party [escort], which must meet the attacker in advance of the battery-positions, naturally in an oblique direction.

I consider the "Through Attacks" as very useful and worthy of introduction amongst us. One must agree with what Dragomirow says with reference to them. "Mischances are certainly possible. They can occur also in firing, in fighting, and in gymnastics, but in the first place they will occur seldom, in the second they will be a hundredfold out-weighed by the fact that thus taught, our infantry and cavalry will not be taken by surprise by anything unexpected in battle."

With reference to the exercises for "Accustoming to Firing," my readers will doubtless be of my opinion that they are indeed well adapted to the purpose, but that their employment is not to be expected in any other state than Russia.

From all that I have mentioned heretofore it appears that Dragomirow places greater value on education than on drill. If there exist any doubt about his views in this respect, it is only necessary to read his treatise "Training and Education" which appeared in Helwing in 1892,—translated also by Lieutenant von Tettan. He says there, referring to the matter in question, that many people formerly over-rated the importance of the drill ground in comparison with the manœuvre field. "The point is therefore What and How one must learn on the drill ground? Suvarov had learnt on the drill ground and the drillers also have learnt there; the difference in the result however, has been most notably demonstrated. The pedagogue's axiom has long been familiar. "It is not a question of the What but of the How." It is interesting to compare with this the views which Drigalski the well known authority on, and describer of, the Russian army obtained by his visits to the Russian Summer Camp of Exercise.

"The position of the Russian soldier does not quite correspond with the rules that are current with us. He throws his weight in standing and marching less on the ball than on the heel of the foot, so that according to our aesthetic ideas his stomach is too far forward. Something of the same sort is the case in the position for shooting in which the Russian does not bend so for forward as we do. The Russian calls his position an unconstrained one, and laughs at the drawnback knee and upper part of the body curved like a wheel of our soldiers. [This was in 1885. The German regulations forbid this in the drill of 1889 Tr.] The motions of the Manual Exercise are perhaps not quite so exact as ours, and one sees individual men doing them late without being reproved for it. One everywhere hears officers answer if one makes a remark on the subject: "we simply practise what would be actually required in war: more is unnecessary and waste of time." The consciousness that to reach our goal now in peace, there is necessary a certain *plus* of performance, or if you will, an excess of it with the intention of its being a means of schooling or simply as gymnastics, does not seem to be found in Russia. In contrast with the appearance of extra-strict training in detail in the time of the Czar Nicholas (at the camp of Kalish, *e. g.*, the Russian considered the position, march, and motions of the Prussian troops capable of much improvement) one gets the impression amongst other things of a comfortable let well-alone. It is also observable especially in the march, although they march much more in step [*i. e.* at attention] than we do. The march of the Russian is comfortable and looks quicker than ours, but as the steps are shorter they get over rather less than more ground in the same time than we do. Which is the most tiring at a stretch I leave undetermined, but in any case the marching performances of the Russian soldier are beyond question. The long step is, so it is said, absolutely banished from the programm eof training, and is looked upon as a useless refinement. The march and keeping step is practised by a number of soldiers being made to march in file round a beaten drum in a circle, till the quick step is exact; less depends on the position. At first one sees the legs struggling in and out; gradually however, the thing gets regulated. Later on marching is done in ranks, sections, and whole companies."

After mentioning an occasion on which Drigalski saw the long steps used for punishment, he continues. "However that may be, I have seen troops, trained in this, I might say, more empirical method, whose march must strike even Prussian eyes as military and even elegant. I am here thinking specially of some rifle battalions and the

Finnish Life-Guard Regiment in Krasnoe-Selo. Specially in this excellentlytrained and evenly recruited regiment at a march past in companies I saw such a self conscious bold bearing, such even, free, stepping out, such a general and unconstraned dressing, that I was obliged to express repeatedly my loud admiration."

Dragomirow's ideas on the necessity of the sole sway of field service considerations appear to be of weight also in the St. Petersburgh military district,

With us, on the contrary, adherence to the ancient Prussian exercise drills is looked upon as one of the surest means for the production of a strict discipline, and according to my idea the results obtained would be the better, the more we are accustomed to demand the greatest strictness in the fight, and indeed now in peace time, and this accords too with the spirit of our regulations.

I pass to what Dragomirow says about training, now that we have considered his views on education. In doing so it appears to the point to explain Dragomirow's method of teaching. He lays down, like Suwarow, that the soldier must learn to understand everything that he does, not only the elementary handling of troops, but also the tactical principles which determine their application.

The teaching of the soldier is to precede every practice and be in reference to the object of it, because, as is again explained, a man obeys the more willingly the more the necessity of what is required is clear to him. The soldier is to understand too every manœuvre, that is every battle-exercise, and is therefore to have impressed on him, by their being pointed out, the actual tactical principles governing the application of the schemes, and the mutual action of the different arms. Take the co-operation of infantry with artillery for instance. Dragomirow would bring it to the man's understanding thus:—"Next the two arms are to mutually learn to know each other. The infantry for this wheels off by zugs, the guns pass into the space between, and in unconstrained intercourse the artilleryman shows the infantryman his horses, his guns, and their detachments. The infantryman strokes the horses, tries to load the guns, and then as a return explains the mechanism of his weapon. After an instruction on the principles of the mutual support of the two arms, the exercise begins, at which as a rule one regiment and one battery will work together. The regiment deploys for the fight, one gun goes into the firing line. The men of the latter have been before instructed to make room for it immediately, and to protect it by taking up a position in front and on the flank and must now of themselves act in accordance therewith. Another gun later marks a battery driving up on the flank. The nearest infantry company, for instance, out of the battalion reserve (the Russians so call all companies not in the first line) must thereupon without orders take up a position on the far side on its flank and front, but send word to the battalion commander.

A third gun drives up on the other wing but with another front than the infantry, the next company concerned must take up accordingly another position to cover it. Then if the artillery goes forward, the firing line must see that it does not remain behind. Now the order is given to the regiment "Retire," while the artillery is ordered to remain halted. Now the companies near the artillery must remain halted to cover it, in neglect of the general order to retire. Finally an attack on the battery, which must be met by its escort, finishes this elementary kind of exercise. Its duration is fixed by Dragomirow at from two to three hours, and he thinks that in consequence of such instruction no fault will be committed by infantry so directed, in reference to artillery.

This method, which is also proposed for the mutual working of the other arms, has the advantage of great plainness, and offers, as primary teaching for the fight with all arms, all advantages which in teaching every resolving of a subject into its elements carries with it.

For the rest Dragomirow requires first individual-training. He restricts himself in this to a few remarks, which again accentuate in everything adaptation to warlike conditions. In gymnastics he recommends only the applied exercises, and gives as illustrating the best exercise-ground, a fort of strong profile with all possible obstacles.

The instruction in the use of the weapon should not according to Dragomirow begin with the Manual Exercise but with preparations for firing and bayonet practice. On bayonet practice he places not only a moral, but a great practical value. He is in fact, in all earnestness, even to-day a champion of the Suwarow view of bullet and bayonet, since he says in his memo to soldiers: "Save up your bullet three days, yes even during the whole campaign if you have no use for it, shoot seldom but shoot sure." "With the bayonet thrust hard: the bullet misses, the bayonet does not; the bullet is a fool, but the bayonet is a stout fellow." In an order to his troops in 1892 he forbids both lying down and kneeling in the firing line in the attack. According to his view "such an advance does not increase the losses but rather lessens them since hitting a single man is no easy matter in peace, in battle it is entirely accidental; the advance however, will be far more energetic and unanimous, since each one will recognize that he will not find cover from the enemy's fire until he arrives at the enemy himself."

This order is contrary to the Russian regulations which recognize as ours do an advance by rushes with lying down, and prescribes it for the attack from 800 on to 200 paces in open ground; from which it appears that Dragomirow can give himself leave in such matters. For the rest, even amongst us, the Dragomirow attack with the firing of skirmishers rushing forward, known briefly as the "Russian," has its adherents. But it makes too large demands on human nature and must therefore fail. With us it has been thoroughly tested on the range in order to bring palpably under the eyes of its defenders their error and since then it has been rightly done away with.

Dragomirow however, does not lose sight of the possibility that his attack may be impracticable. The firer is still to be trained therefore, as before, to the use of his weapon while taking advantage of cover. Special exercises are further to be done in order to represent the carrying forward by waves of the firing line, when brought to a stand by casualties (in peace done by signal) by the uninterrupted advance of remaining parties. On the skilful leading of these parties with all cover utilized, Dragomirow lays the highest value; but in the actual battle exercises he appears to wish to strengthen above all the offensive spirit, to the detriment of the fire-struggle and taking of cover.

I believe that this trait of the Dragomirow mode of fighting, suited though it is to the Russian national character, would have very dubious results against a disciplined and good shooting antagonist.

Even in 1877 the defective fire-preparation of the Russians, according to Kuropatkin, was the chief fault in their attacks, undertaken with acknowledged bravery. By adherence to Dragomirow's directions in this respect, like experiences will be met with in the next war, which if they are our opponents, can only be agreeable to us."

This is true. But there is surely truth on both sides. It is impossible to suppose an officer of Dragomirow experience does not know that, men advancing against a hail of bullets will take cover. But it is almost an axiom in training to train to the impossible in peace, in order to attain the possible in war. His aim then is to imbue men with the idea that when advancing to the attack it is not *right* to remain under cover. It has been, is now, and I believe ever will be, the glory of the British soldier that he can be trusted to cover. He is only too keen to leave it. But it is not so with all soldiers; and ours is a heterogeneous army.

As regards the value Dragomirow places on the bayonet, surely there is something in it. "It commonly happens in modern war" says Kinglake, "that the dominion of one body of infantry over another is not found to depend at the last upon the physical strength of man or the quality of his weapons, but rather upon faith, or in other words, upon sense of power." Now this sense of power, this faith in himself and his fellows, cannot co-exist in the soldier with a belief in driving out his enemy at long range, it must imply a determination to come to hand-grips with him, and to clear him out. And if the defender has the same faith it must come to a deadly hand to hand struggle as in the case to which Kinglake alludes. As von Meckel (Elemente der Taktik) has well said "The Fire-fight has assumed, in the modern infantry combat, the predominant rôle. Its destructive power punishes in the most bloody way every premature use of cold steel.—The issue of the fire-fight has become in the infantry struggle the primary basis of every decision. *But now as ever, the Laurel of Victory waves before the point of the bayonet.*" The italics are his.—But to quote again from von Mach's most interesting paper.

The "practical" training of the company for battle forms, with Dragomirow, the basis of the entire training of infantry. "If the companies are good the battalions will also be good."

It depends chiefly on this, "that each company in the unity of the battalion should act as part of a harmonious whole; the companies must before all in all situations fix their thoughts on mutual support."

"Often" says he "the principles of support require that the battalion should form one body, often, in order to satisfy the same principle it is better to split up the battalion into its organic constituents the companies; that is to give to the latter a corresponding portion of independence, hence the battle formation in companies, of the battalion."

He then proceeds to give some details of Russian formations which I omit. It appears from them that the Russians have formations for battalion drill more like ours than those of the Germans. They have of course only four companies to the battalion. They call their firing line a "chain" and each group of four men a "link." "The behaviour of the companies in this formation (battalion in column) Dragomirow compares strikingly with that of the soldier in the "chain link."

"This is the smallest unit of the firing line and consists of four men. In the chain link" says he "perhaps one lies down, another stands, the third sits, the fourth kneels; they do not fire at the same time, but they must strive to reach the goal prescribed for the chain, and for that purpose must support each other perhaps the one by shooting, the other by bayonetting." Just so must the companies of the battalion act, "the formation, the use of their weapons, &c., may be different, but the end must unite all of them." The same principles hold for larger bodies.

For the individual Dragomirow requires next the "Front-Training" that is our parade-exercise. In it no general idea is to be laid down, but the Drill-formations are to be brought to the clearest possible representation. He rightly considers it very important to keep the attention fixed, and all possible small means are recommended for it, such as we also use, namely, calling out of intended portions to carry out different unforeseen words of command, avoidance of a regular order in the words of command &c.

After explaining the "Front-Training" Dragomirow comes to his "Applied Regulations." He understands by that developments from all conceivable formations against an enemy, who is to be engaged in all possible directions, distances, and combinations of arms.

In accordance with the rule that every soldier is to understand his manœuvre before a new engagement, the direction from which the enemy is to be expected is always to be communicated to him, or the enemy's position carefully pointed out, all in a loud and distinct voice.

He then gives a number of practices, supposing the enemy in eight different directions, and recommends ones making up one's mind as to What I am to do if my opponent appears very near, near, at middle and long distance, if it is infantry, artillery, or cavalry?

Dragomirow gives his solutions for a large number of such examples. He expressly states however, that he in nowise declares that he has found the best solutions, but simply gives his own for free consideration.

This way of preparing himself and the troops for war-situations is indeed very instructive, and in fact we use it. Dragomirow's systematic management of it is very decidedly to be recommended for the teaching of both leader and troops."

Von Mach here quotes some examples for the company in column of sections, first of infantry attacked by cavalry from the rear, then from half left rear. In the former case they turn about and form a sort of echelon from the centre, the two centre sections closing on each other and firing four-deep volleys. In the latter case, the column turns three-quarters left about and wheels into half echelon to the left. The former is at 1,500 paces, the latter at 700. There seems nothing specially new about this. Of cavalry attacks in general, Dragomirow says "In attacks at 300 paces there is no time for volleys, in those at 100 paces none for altering the front. In this case all that can be done is to make a turn towards the enemy and charge bayonets." Then follow examples of infantry against infantry. In these also there is nothing calling for much remark except that he precedes every formation by a turn towards the enemy. Of this von Mach justly remarks "I consider it a very practical thing, the introduction, before the beginning of each rapid formation for fight of the company, of the turn towards the enemy, and as very important the observation of the enemy's movements as they arise in the distance, which requires under certain circumstances the willing renunciation of both forming and firing. In a very practical way Dragomirow emphasizes the necessity when resisting cavalry of leaving out useless words of command such as frequently pointing out the mark where every one sees it &c."

After touching slightly on the "Applied Regulations" for battalions and regiments, von Mach comes to Dragomirow's manœuvres, by which he means battle-exercises, and notes the following points :—

1.—"In the preliminary exercises the problems, *e. g.*, for battalion-manœuvre are to be made known a week beforehand and the leader is allowed to inspect the country first, in order to be able to pass from easier to more difficult problems, namely to such as ours.

2.—Attacking and defending detachments are according to Dragomirow to be of the same strength, for "if we suppose that it is in accordance with the nature of things that the attacker must necessarily be the stronger, as the German manœuvrers assume, then we sin against reality, for attacks are made and victory won not only with equal but often with smaller forces; secondly, we see in the manœuvres not a handling of them for instruction but a game to be won; thirdly the conviction becomes inrooted that attack is possible only with superior forces." Dragomirow does away therefore with the umpires decision on the issue of the fight. He thinks they make one prudent and cleverer in manœuvring but that they injure the moral qualities on which victory depends namely "unshakeable daring, swiftness of decision, and stubbornness." Besides he considers the custom as anything but useful of listening "disinterestedly and calmly to utterances so degrading to every soldier such as "they are beaten, their attack has failed" and every battle-exercise is therefore to end with the "Through Attacks" already mentioned, and "neither victor nor vanquished is to be pointed out by the umpire."

"This is a point" continues von Mach "decidedly worth considering; for the custom of criticizing, chiefly on the score of strength in numbers, a leader's resolve, when making or accepting a decision might with many leaders have hurtful consequences. If the last reserve is used up and unless we are, somewhat exceptionally, still in the position to clear out without considerable loss, then the resolve under the unfavorable circumstances to force victory, is almost always the correct one. The steadfast unshakeable determination of the leader to conquer is still often able to neutralize unfavorable chances and bring about a good ending. At the very worst those troops serve their country better who even sacrifice themselves consciously by pressing an attitude of decision in a combat once begun and carried through to decisive distance than do those who commence a retreat, which in war can end only in utter annihilation."

Now has all this any bearing on the army in India? Whatever we may think of Dragomirow's way of carrying out his system, that such a system is sound can hardly be doubted. Do we find here a careful war-education and war-training of the soldier advancing from the individual to large bodies of troops? First as regards education, we have an army consisting of many races. Is it not the fact that we are trying to train these men's hearts and heads exclusively through their arms and legs, that is teaching them drill and trusting to their being found not wanting in war? Do we not too often hear comparisons of one race as against another? *Esprit de corps* is of course an excellent thing but surely we have no call to go in for *esprit de race* if I may so call it. On the contrary is it not our duty so to train the raw material of those, good or bad, the Government puts in our hands that they shall be ready for war through zeal for duty, a spirit of resolute self control, and affection for those set over them? I do not believe it is impossible to instil these feelings into any of the races we have to do with. At any rate is it not absolutely necessary that we try? If it is necessary in Russia, it is ten times so in India.

To me this question seems of immense importance. We are saying, such and such a race were good soldiers once, but, having become unused to war, are so no longer, and we must not enlist them. How long can we go on like this? All races gradually become unused to war. It is almost as true of Germans or Russians as of natives of India. Surely it is then our duty to keep before their eyes so vivid an impression of war that nothing in it shall be surprising to them. At present we can pick and choose between this and that class, this and that caste, and are so far right no doubt, but would this arrangement alone stand the strain of a great war?

Again, have we enough of applied drill and tactical training? Camps of exercise are excellent no doubt, but do the companies and regiments attending them come so trained as to be able fully to profit by them?

The drill books lay down now no normal formations for war. The fact is the details of minor tactics at present are unsettled and have been so for some time past. Troops can therefore only be efficiently trained by such action as Dragomirow's, that is by officers of reading and experience taking up the matter and showing possible combinations in the varying circumstances of war.

Again is every manœuvre so carefully explained beforehand that say, at least every commissioned officer understands exactly what is about to be done? It is not my experience. Much less that the regiment as a body has a fair idea of it.

Von Mach brings his paper to a close in the following words :—

" To conclude, I give a sample of how Dragomirow invites his officers to study. "However much has been said," he says with reference to his directions ; " it is still insufficient. Even the fullest and most detailed instructions leave gaps and something unexpressed ; therefore we must not confine ourselves to the regulations and instructions, but we must read, read, and read ; for choice, the detailed works on military history and performances of those who have not only been engaged in war themselves, but have written of it.

"Specially make yourselves acquainted with the work of that ever memorable man our great Suwarow. Only if you are penetrated with his spirit will you acquire the art of speaking with the soldier simply, intelligibly and from heart to heart.

" But whatever you read take nothing from any one as granted. Never quiet yourself with the thought, so and so says so, therefore it is true. But put to yourself this question : why does he so speak ? When you have found out this " why " or the author has given it to you with his arguments, then you can rest satisfied, and then his idea becomes yours, for you have yourself travelled the same road by which the author arrived at it. If however you have not discovered the " why," then do not believe what the author says, even if it was Napoleon himself."

" I believe we can declare ourself in harmony with these words " concludes von Mach, " whatever we may think of Dragomirow's ideas in details."

United Service Institution of India.

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THE SYSTEM OF ARMY TRAINING OF GENERAL DRAGOMIROW OF THE RUSSIAN ARMY.

By Major Tonnochy, 4th Sikhs.

The Russian soldier has a proverb "It is jollier to die in company and little mother Russia has sons enough," on which one Drigalski has remarked "this feeling, namely the indifference to danger arising from a certain want of intelligence, though accompanied by undoubted heroism, will be probably in the future as it has been in the past, the strong point of the Russian infantry."

This want of initiative yet possession of quiet uncomplaining courage in the discharge of duty, must be remembered when considering the system of training adopted by a Russian. National characteristics show up no where so much as in war, and a leader is wise who remembers them.

Dragomirow commanded the 14th Russian Division which led the way at the passage of the Danube in the Russo-Turkish War, and distinguished himself at the Shipka Pass. He now commands the military district of Kieff, and, according to Captain von Mach of the 4th Magdeburg Infantry Regiment whose paper in the Neue Militärische Blätter for October 1895, I wish here to bring to notice and discuss—he would in case of war be appointed to take chief command against Austria, if not selected as Chief of the Staff to the whole Russian army. In peace the General has under his orders 4 army corps, 5 cavalry divisions, 1 brigade of rifles, and 1 of reserve infantry. It is evident therefore, that his views must have great weight and influence. He is the author of several military works, one of which is the basis of Captain von Mach's article.

From this article which I think of great interest as giving not only a Russian but a Prussian view of the subject, I must quote freely. "Dragomirow's system of training" says the writer "is based on that of the Great Suwarow. 'Suwarow' taught his troops in such a way that they came on nothing new in the day of battle, and attacked with cold steel with the same earnestness they had shown at manœuvres. The youngest soldier of those falling within the sphere of his influence knew war-craft both practically and theoretically better than it is known at present in any European army even the most highly trained.

When hehad clearly recognized that, for victory, it is needful to strengthen the soldier intellectually, morally, and physically, Suwarow, as a direct consequence, brought his system of education in absolute harmony with these objects. The development of the power of apprehension, and especially of resoluteness of character; the blunting of the instinct of self preservation so far as that is to be attained in a living being; the strengthening of the intelligence of the lowest soldier in the principles of war-craft; that was Suwarow's system in all its simple and comprehensible sublimity. For his soldier there was nothing unexpected in the fight, since he had already in peace-time been tested in the most difficult impressions that battle was able to produce. When however, a man is so educated that nothing can astonish and upset him, when he knows in addition what he has to do in his own humble sphere of activity, then he cannot be conquered then he must conquer."

In his work, Dragomirow separates, Education from Training. He attributes great value to education, for the success of the training depends on the education of the soldier, that is, in the degree in which he is penetrated with a consciousness of doing his duty.

According to Dragomirow we must watch and shape the heart and head of the soldier before all things.

"The time, writes Dragomirow," "when it was believed possible to influence the heart and head, through the arms and legs, is for ever past, and it is so because it was false to suppose it, as has been proved in a whole list of campaigns. There are indeed still people who think so, as is ever usual in the transition from old to new ideas; but they are gradually yielding their convictions and are compelled day by day, step by step, to accept as true, much which they formerly held as unbearable heresy."

"It is not to be disputed" he continues, "that something does enter the heart and the head through the arms and legs (Dragomirow mean of course the power of habit); but this something in the first place is not effectual for a man who is called to sacrifice his life for his country; in the second place, it has frequently quite unexpected, quite the opposite of the intended, results." Dragomirow probably means that a soldier chiefly drilled and not sufficiently educated for war, does the thing he has practised by habit, but in the presence of unforeseen demands on him he is quite at a loss.

"We should therefore before all things seek to implant in him a soldiers feeling of duty, that is to say, to develope honourably his understanding, to make his heart stout, and the rest comes of itself."

He does not therefore at all consider as useless the teaching to fight, shoot, and march, &c, but simply means "that one is able to instruct at least ten times easier a man penetrated with a feeling of duty and of an honourable mind than one altogether or partially wanting these characteristics," and there he is doubtless quite right.

"We must not forget" says Dragomorow, in the same work, "that it is our vocation to destroy and to be destroyed, and we must not shut our eyes to it."

Later he continues,—

"Thus the soldier must be so educated that he is not afraid to be destroyed but so that at the same time this destruction costs the enemy dear. For this, not only self denial, but intellect too, is required: in war self denial is strengthened chiefly by education, while intellect is developed in a military point of view, chiefly by training."

Dragomirow far from disputing the intimate relation that exists between education and training, admits "that it goes without saying that by a rational management of each, they mutually support one another, because a man educated to sincere obedience can be more easily instructed in all sorts of exercises such as bayonet fighting, firing, and manœuvring; moreover while we exercise him in any of his duties we strengthen him in obedience, and we strengthen him all the more when our demands are practical, that is the more they are of such a kind that it is clear for what purpose they are required. For example, (1) I cause a man to take aim once, twice, twenty times in succession. (2) I make one and the same motion of the Manual Exercise just so, twenty times in succession. In the first case the stupidest soldier understands the object, while in the second (it is the idea of Dragomirow a highly cultivated man) the cleverest does not comprehend why it is necessary. The latter we can cause to become a punishment; but then we must take care that every one takes in that it is a punishment.

"This practical spirit in our demands I too hold" "says von Mach to be of uncommon importance; for every man obeys the more readily the more evident to him is the reasonableness and needfulness of the thing commanded. Now the soldier must certainly obey without testing the quality of the order, that is his views on this point must have no influence on his obedience, but we shall come the nearer to this ideal the more deeply we confirm the soldier, through practice, in the conviction that all that is ordered is good and sensible. The confidence so won will then make him equally zealous in carrying out orders whose object he does not rightly perceive.

The requirement that only what is reasonable be ordered, appears so self evident that many would consider its accentuation superfluous; in reality, however, it is oftener disregarded than one would suppose, and that too by those who ought to know better. For instance such a long standing at "attention" is often required of the soldier that he is directly betrayed into disobedience, that is into secretly standing at ease."

Von Mach then speaks of the injury to discipline of long marches at attention, of long periods in the kneeling position, of refusing the use of water-bottles on hot field days and so forth, which faults with our "march at ease" and "rest" position &c., are not common faults with us I hope. In such cases, as he says, it is better to give the order than to wink at the men doing it themselves, the latter being hurtful while the former is distinctly beneficial to discipline. "If we spare people at the proper moment then we can ask tenfold of them when necessary.

He then says that Dragomirow lays great stress on the fulfilment by the soldier of interior and guard duties, and considers he should be prepared by instruction for all contingencies, examples being quoted for his enlightenment, and a properly regulated system of punishment maintained, by which the instruction is to be enforced. Von Mach next comes to two very interesting matters dealt with by Dragomirow· He says.—

"Before explaining exactly Dragomirow's method of training, I might mention two sorts of exercises of his which should well serve as education for the soldier, inasmuch as they accustom him to the dangers of fire fighting and the close struggle, as far as is possible in peace.

"These are the "Accustoming to Firing" and the "Through Attacks" the former a device of Dragomirow's, the latter derived from Suwarow. The "Accustoming to Firing" is to be used only by the special order of higher authorities, and is not yet introduced into the whole Russian army.

The individual man is to be accustomed to infantry fire, by being placed straight in front of a target against which a marksman at 50 paces fires single shots placed to the right and left of the soldier standing in front of the target. The exercise is to be so arranged as to have the character of a pleasure, as Dragomirow literally expresses it, and not that of a forced duty. [One can imagine a rather sickly smile on the soldier's face till he got accustomed to it.]

The troops are to be accustomed to artillery fire by being exercised in the space between the targets and artillery firing with shell, so that the shots fly over the troops at a dangerous (?) height.

Batteries of artillery in the same way are to be placed opposite each other between two target positions, and then each side is to fire over the other at the targets beyond.

Finally firing practices are to take place of mixed detachments, 1 battalion, 1 squadron, 1 to 2 batteries, against target positions, approaching them in an actual service way, under a settled general idea. In this case too the troops are to be practised in having the artillery shooting over them, and the rearward parties of infantry shooting past them. These last practises are to be introduced *officially* into the whole Russian army.

The "Through Attacks" are to accustom a man to the impressions made by attacking infantry and cavalry, as well as cavalry to that of the proximity of attacked infantry and artillery.

Dragomirow wishes to see these exercises of Suwarow's practised not only after every manœuvre, by which he understands every battle-exercise, but also on the drill ground, and these exercises are also to be introduced officially into the whole Russian army.

In the attack of *infantry against infantry* they are to be placed opposite each other in close order, in line and column, at a distance of 400 paces, and one side thereafter carries out the attack as follows :—

Swift advance to 200 to 250 paces firing volleys. Then a further advance from 100 paces on with beat of drum, from 50 on with arms at the charge. At 20 to 30 paces a hurrah is given, and they pass with weapons uplifted *through* the party opposite them. This party which has fired volleys till the attackers had advanced to within 50 yards, rushes to meet them in the same way with hurrahs. As they meet, the quickest double is required. After passing through them the former attackers continue the movement for 400 paces, in order then to place themselves so as to receive the attack of the former defenders.

The attack of cavalry through infantry (it is noteworthy that Dragomirow knows it also the reverse way), takes place at the same distance. In the former case the infantry files take up at first an interval of 5 paces and the cavalry carries out the movement at a trot. Later the interval between files is to be closed to 3 paces and the attack in half zugs, finally at full speed to ensue. The infantry fires therewith a volley at 200 paces. [Forbes Mitchell in his Reminiscences of the great Mutiny" relates how the 9th Lancers charged the square of the mutinied 41st N. I. "The Lancers charged well up to within about 30 yards when the horses turned off right and left from the solid square. * * * The squadrons were brought round again, and we saw Serjeant-Major May, who was mounted on a powerful untrained horse, dash on the square and leap right into it, followed by the squadron on that side. * * * The horses were thus drilled to turn off and gallop clear of the squares instead of charging home right through the infantry. When it came to actual war, the horses * * naturally acted as on a field day. * * * I am convinced that this is the reason that the untrained remount ridden by Sergt.-Major May charged into the square of the 41st and broke it, while the well drilled horses galloped round its flanks in spite of their riders.]"

"In the *attacks against artillery*, which are also to be specially practised, the infantry and cavalry employ the extended order, the closed portions in rear have to turn towards the covering party [escort], which must meet the attacker in advance of the battery-positions, naturally in an oblique direction.

I consider the "Through Attacks" as very useful and worthy of introduction amongst us. One must agree with what Dragomirow says with reference to them. "Mischances are certainly possible. They can occur also in firing, in fighting, and in gymnastics, but in the first place they will occur seldom, in the second they will be a hundredfold out-weighed by the fact that thus taught, our infantry and cavalry will not be taken by surprise by anything unexpected in battle."

With reference to the exercises for "Accustoming to Firing," my readers will doubtless be of my opinion that they are indeed well adapted to the purpose, but that their employment is not to be expected in any other state than Russia.

From all that I have mentioned heretofore it appears that Dragomirow places greater value on education than on drill. If there exist any doubt about his views in this respect, it is only necessary to read his treatise "Training and Education" which appeared in Helwing in 1892,—translated also by Lieutenant von Tettau. He says there, referring to the matter in question, that many people formerly over-rated the importance of the drill ground in comparison with the manœuvre field. "The point is therefore What and How one must learn on the drill ground? Suwarow had learnt on the drill ground and the drillers also have learnt there; the difference in the result however, has been most notably demonstrated. The pedagogue's axiom has long been familiar. "It is not a question of the What but of the How." It is interesting to compare with this the views which Drigalski the well known authority on, and describer of, the Russian army obtained by his visits to the Russian Summer Camp of Exercise.

"The position of the Russian soldier does not quite correspond with the rules that are current with us. He throws his weight in standing and marching less on the ball than on the heel of the foot, so that according to our aesthetic ideas his stomach is too far forward. Something of the same sort is the case in the position for shooting in which the Russian does not bend so for forward as we do. The Russian calls his position an unconstrained one, and laughs at the drawnback knee and upper part of the body curved like a wheel of our soldiers. [This was in 1885. The German regulations forbid this in the drill of 1889 Tr]. The motions of the Manual Exercise are perhaps not quite so exact as ours, and one sees individual men doing them late without being reproved for it. One everywhere hears officers answer if one makes a remark on the subject: "we simply practise what would be actually required in war: more is unnecessary and waste of time." The consciousness that to reach our goal now in peace, there is necessary a certain *plus* of performance, or if you will, an excess of it with the intention of its being a means of schooling or simply as gymnastics, does not seem to be found in Russia. In contrast with the appearance of extra-strict training in detail in the time of the Czar Nicholas (at the camp of Kalish, *e. g.*, the Russian considered the position, march, and motions of the Prussian troops capable of much improvement) one gets the impression amongst other things of a comfortable let well-alone. It is also observable especially in the march, although they march much more in step [*i. e.* at attention] than we do. The march of the Russian is comfortable and looks quicker than ours, but as the steps are shorter they get over rather less than more ground in the same time than we do. Which is the most tiring at a stretch I leave undetermined, but in any case the marching performances of the Russian soldier are beyond question. The long step is, so it is said, absolutely banished from the programm eof training, and is looked upon as a useless refinement. The march and keeping step is practised by a number of soldiers being made to march in file round a beaten drum in a circle, till the quick step is exact; less depends on the position. At first one sees the legs struggling in and out; gradually however, the thing gets regulated. Later on marching is done in ranks, sections, and whole companies."

After mentioning an occasion on which Drigalski saw the long steps used for punishment, he continues. "However that may be, I have seen troops, trained in this, I might say, more empirical method, whose march must strike even Prussian eyes as military and even elegant. I am here thinking specially of some rifle battalions and the

Finnish Life-Guard Regiment in Krasnoe-Selo. Specially in this excellentlytrained and evenly recruited regiment at a march past in companies I saw such a self conscious bold bearing, such even, free, stepping out, such a general and unconstraned dressing, that I was obliged to express repeatedly my loud admiration."

Dragomirow's ideas on the necessity of the sole sway of field service considerations appear to be of weight also in the St. Petersburgh military district,

With us, on the contrary, adherence to the ancient Prussian exercise drills is looked upon as one of the surest means for the production of a strict discipline, and according to my idea the results obtained would be the better, the more we are accustomed to demand the greatest strictness in the fight, and indeed now in peace time, and this accords too with the spirit of our regulations.

I pass to what Dragomirow says about training, now that we have considered his views on education. In doing so it appears to the point to explain Dragomirow's method of teaching. He lays down, like Suwarow, that the soldier must learn to understand everything that he does, not only the elementary handling of troops, but also the tactical principles which determine their application.

The teaching of the soldier is to precede every practice and be in reference to the object of it, because, as is again explained, a man obeys the more willingly the more the necessity of what is required is clear to him. The soldier is to understand too every manœuvre, that is every battle-exercise, and is therefore to have impressed on him, by their being pointed out, the actual tactical principles governing the application of the schemes, and the mutual action of the different arms. Take the co-operation of infantry with artillery for instance. Dragomirow would bring it to the man's understanding thus:—"Next the two arms are to mutually learn to know each other. The infantry for this wheels off by zugs, the guns pass into the space between, and in unconstrained intercourse the artilleryman shows the infantryman his horses, his guns, and their detachments. The infantryman strokes the horses, tries to load the guns, and then as a return explains the mechanism of his weapon. After an instruction on the principles of the mutual support of the two arms, the exercise begins, at which as a rule one regiment and one battery will work together. The regiment deploys for the fight, one gun goes into the firing line. The men of the latter have been before instructed to make room for it immediately, and to protect it by taking up a position in front and on the flank and must now of themselves act in accordance therewith. Another gun later marks a battery driving up on the flank. The nearest infantry company, for instance, out of the battalion reserve (the Russians so call all companies not in the first line) must thereupon without orders take up a position on the far side on its flank and front, but send word to the battalion commander.

A third gun drives up on the other wing but with another front than the infantry, the next company concerned must take up accordingly another position to cover it. Then if the artillery goes forward, the firing line must see that it does not remain behind. Now the order is given to the regiment "Retire," while the artillery is ordered to remain halted. Now the companies near the artillery must remain halted to cover it, in neglect of the general order to retire. Finally an attack on the battery, which must be met by its escort, finishes this elementary kind of exercise. Its duration is fixed by Dragomirow at from two to three hours, and he thinks that in consequence of such instruction no fault will be committed by infantry so directed, in reference to artillery.

This method, which is also proposed for the mutual working of the other arms, has the advantage of great plainness, and offers, as primary teaching for the fight with all arms, all advantages which in teaching every resolving of a subject into its elements carries with it.

For the rest Dragomirow requires first individual-training. He restricts himself in this to a few remarks, which again accentuate in everything adaptation to warlike conditions. In gymnastics he recommends only the applied exercises, and gives as illustrating the best exercise-ground, a fort of strong profile with all possible obstacles.

The instruction in the use of the weapon should not according to Dragomirow begin with the Manual Exercise but with preparations for firing and bayonet practice. On bayonet practice he places not only a moral, but a great practical value. He is in fact, in all earnestness, even to-day a champion of the Suwarow view of bullet and bayonet, since he says in his memo to soldiers: "Save up your bullet three days, yes even during the whole campaign if you have no use for it, shoot seldom but shoot sure." "With the bayonet thrust hard: the bullet misses, the bayonet does not; the bullet is a fool, but the bayonet is a stout fellow." In an order to his troops in 1892 he forbids both lying down and kneeling in the firing line in the attack. According to his view "such an advance does not increase the losses but rather lessens them since hitting a single man is no easy matter in peace, in battle it is entirely accidental; the advance however, will be far more energetic and unani mous, since each one will recognize that he will not find cover from the enemy's fire until he arrives at the enemy himself."

This order is contrary to the Russian regulations which recognize as ours do an advance by rushes with lying down, and prescribes it for the attack from 800 on to 200 paces in open ground; from which it appears that Dragomirow can give himself leave in such matters. For the rest, even amongst us, the Dragomirow attack with the firing of skirmishers rushing forward, known briefly as the "Russian," has its adherents. But it makes too large demands on human nature and must therefore fail. With us it has been thoroughly tested on the range in order to bring palpably under the eyes of its defenders their error and since then it has been rightly done away with.

Dragomirow however, does not lose sight of the possibility that his attack may be impracticable. The firer is still to be trained therefore, as before, to the use of his weapon while taking advantage of cover. Special exercises are further to be done in order to represent the carrying forward by waves of the firing line, when brought to a stand by casualties (in peace done by signal) by the uninterrupted advance of remaining parties. On the skilful leading of these parties with all cover utilized, Dragomirow lays the highest value; but in the actual battle exercises he appears to wish to strengthen above all the offensive spirit, to the detriment of the fire-struggle and taking of cover.

I believe that this trait of the Dragomirow mode of fighting, suited though it is to the Russian national character, would have very dubious results against a disciplined and good shooting antagonist.

Even in 1877 the defective fire-preparation of the Russians, according to Kuropatkin, was the chief fault in their attacks, undertaken with acknowledged bravery. By adherence to Dragomirow's directions in this respect, like experiences will be met with in the next war, which if they are our opponents, can only be agreeable to us."

This is true. But there is surely truth on both sides. It is impossible to suppose an officer of Dragomirow experience does not know that, men advancing against a hail of bullets will take cover. But it is almost an axiom in training to train to the impossible in peace, in order to attain the possible in war. His aim then is to imbue men with the idea that when advancing to the attack it is not *right* to remain under cover. It has been, is now, and I believe ever will be, the glory of the British soldier that he can be trusted to cover. He is only too keen to leave it. But it is not so with all soldiers; and ours is a heterogeneous army.

As regards the value Dragomirow places on the bayonet, surely there is something in it. "It commonly happens in modern war" says Kinglake, "that the dominion of one body of infantry over another is not found to depend at the last upon the physical strength of man or the quality of his weapons, but rather upon faith, or in other words, upon sense of power." Now this sense of power, this faith in himself and his fellows, cannot co-exist in the soldier with a belief in driving out his enemy at long range, it must imply a determination to come to hand-grips with him, and to clear him out. And if the defender has the same faith it must come to a deadly hand to hand struggle as in the case to which Kinglake alludes. As von Meckel (Elemente der Taktik) has well said "The Fire-fight has assumed, in the modern infantry combat, the predominant rôle. Its destructive power punishes in the most bloody way every premature use of cold steel.—The issue of the fire-fight has become in the infantry struggle the primary basis of every decision. *But now as ever, the Laurel of Victory waves before the point of the bayonet.*" The italics are his.—But to quote again from von Mach's most interesting paper.

The "practical" training of the company for battle forms, with Dragomirow, the basis of the entire training of infantry. "If the companies are good the battalions will also be good."

It depends chiefly on this, "that each company in the unity of the battalion should act as part of a harmonious whole; the companies must before all in all situations fix their thoughts on mutual support."

"Often" says he "the principles of support require that the battalion should form one body, often, in order to satisfy the same principle

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it is better to split up the battalion into its organic constituents the companies; that is to give to the latter a corresponding portion of independence, hence the battle formation in companies, of the battalion."

He then proceeds to give some details of Russian formations which I omit. It appears from them that the Russians have formations for battalion drill more like ours than those of the Germans. They have of course only four companies to the battalion. They call their firing line a "chain" and each group of four men a "link." "The behaviour of the companies in this formation (battalion in column) Dragomirow compares strikingly with that of the soldier in the "chain link."

"This is the smallest unit of the firing line and consists of four men. In the chain link" says he "perhaps one lies down, another stands, the third sits, the fourth kneels; they do not fire at the same time, but they must strive to reach the goal prescribed for the chain, and for that purpose must support each other perhaps the one by shooting, the other by bayonetting." Just so must the companies of the battalion act, "the formation, the use of their weapons, &c., may be different, but the end must unite all of them." The same principles hold for larger bodies.

For the individual Dragomirow requires next the "Front-Training" that is our parade-exercise. In it no general idea is to be laid down, but the Drill-formations are to be brought to the clearest possible representation. He rightly considers it very important to keep the attention fixed, and all possible small means are recommended for it, such as we also use, namely, calling out of intended portions to carry out different unforeseen words of command, avoidance of a regular order in the words of command &c.

After explaining the "Front-Training" Dragomirow comes to his "Applied Regulations." He understands by that developments from all conceivable formations against an enemy, who is to be engaged in all possible directions, distances, and combinations of arms.

In accordance with the rule that every soldier is to understand his manœuvre before a new engagement, the direction from which the enemy is to be expected is always to be communicated to him, or the enemy's position carefully pointed out, all in a loud and distinct voice.

He then gives a number of practices, supposing the enemy in eight different directions, and recommends ones making up one's mind as to What I am to do if my opponent appears very near, near, at middle and long distance, if it is infantry, artillery, or cavalry?

Dragomirow gives his solutions for a large number of such examples. He expressly states however, that he in nowise declares that he has found the best solutions, but simply gives his own for free consideration.

This way of preparing himself and the troops for war-situations is indeed very instructive, and in fact we use it. Dragomirow's systematic management of it is very decidedly to be recommended for the teaching of both leader and troops."

Von Mach here quotes some examples for the company in column of sections, first of infantry attacked by cavalry from the rear, theh from half left rear. In the former case they turn about and form a sort of echelon from the centre, the two centre sections closing on each other and firing four-deep volleys. In the latter case, the column turns three-quarters left about and wheels into half echelon to the left. The former is at 1,500 paces, the latter at 700. There seems nothing specially new about this. Of cavalry attacks in general, Dragomirow says "In attacks at 300 paces there is no time for volleys, in those at 100 paces none for altering the front. In this case all that can be done is to make a turn towards the enemy and charge bayonets." Then follow examples of infantry against infantry. In these also there is nothing calling for much remark except that he precedes every formation by a turn towards the enemy. Of this von Mach justly remarks "I consider it a very practical thing, the introduction, before the beginning of each rapid formation for fight of the company, of the turn towards the enemy, and as very important the observation of the enemy's movements as they arise in the distance, which requires under certain circumstances the willing renunciation of both forming and firing. In a very practical way Dragomirow emphasizes the necessity when resisting cavalry of leaving out useless words of command such as frequently pointing out the mark where every one sees it &c."

After touching slightly on the "Applied Regulations" for battalions and regiments, von Mach comes to Dragomirow's manœuvres, by which he means battle-exercises, and notes the following points :—

1.—"In the preliminary exercises the problems, *e. g.*, for battalion-manœuvre are to be made known a week beforehand and the leader is allowed to inspect the country first, in order to be able to pass from easier to more difficult problems, namely to such as ours.

2.—Attacking and defending detachments are according to Dragomirow to be of the same strength, for "if we suppose that it is in accordance with the nature of things that the attacker must necessarily be the stronger, as the German manœuvrers assume, then we sin against reality, for attacks are made and victory won not only with equal but often with smaller forces; secondly, we see in the manœuvres not a handling of them for instruction but a game to be won; thirdly the conviction becomes inrooted that attack is possible only with superior forces." Dragomirow does away therefore with the umpires decision on the issue of the fight. He thinks they make one prudent and cleverer in manœuvring but that they injure the moral qualities on which victory depends namely "unshakeable daring, swiftness of decision, and stubbornness." Besides he considers the custom as anything but useful of listening "disinterestedly and calmly to utterances so degrading to every soldier such as "they are beaten, their attack has failed" and every battle-exercise is therefore to end with the "Through Attacks" already mentioned, and "neither victor nor vanquished is to be pointed out by the umpire."

"This is a point" continues von Mach "decidedly worth considering; for the custom of criticizing, chiefly on the score of strength in numbers, a leader's resolve, when making or accepting a decision might with many leaders have hurtful consequences. If the last reserve is used up and unless we are, somewhat exceptionally, still in the position to clear out without considerable loss, then the resolve under the unfavorable circumstances to force victory, is almost always the correct one. The steadfast unshakeable determination of the leader to conquer is still often able to neutralize unfavorable chances and bring about a good ending. At the very worst those troops serve their country better who even sacrifice themselves consciously by pressing an attitude of decision in a combat once begun and carried through to decisive distance than do those who commence a retreat, which in war can end only in utter annihilation."

Now has all this any bearing on the army in India? Whatever we may think of Dragomirow's way of carrying out his system, that such a system is sound can hardly be doubted. Do we find here a careful war-education and war-training of the soldier advancing from the individual to large bodies of troops? First as regards education, we have an army consisting of many races. Is it not the fact that we are trying to train these men's hearts and heads exclusively through their arms and legs, that is teaching them drill and trusting to their being found not wanting in war? Do we not too often hear comparisons of one race as against another? *Esprit de corps* is of course an excellent thing but surely we have no call to go in for *esprit de race* if I may so call it. On the contrary is it not our duty so to train the raw material of those, good or bad, the Government puts in our hands that they shall be ready for war through zeal for duty, a spirit of resolute self control, and affection for those set over them? I do not believe it is impossible to instil these feelings into any of the races we have to do with. At any rate is it not absolutely necessary that we try? If it is necessary in Russia, it is ten times so in India.

To me this question seems of immense importance. We are saying, such and such a race were good soldiers once, but, having become unused to war, are so no longer, and we must not enlist them. How long can we go on like this? All races gradually become unused to war. It is almost as true of Germans or Russians as of natives of India. Surely it is then our duty to keep before their eyes so vivid an impression of war that nothing in it shall be surprising to them. At present we can pick and choose between this and that class, this and that caste, and are so far right no doubt, but would this arrangement alone stand the strain of a great war?

Again, have we enough of applied drill and tactical training? Camps of exercise are excellent no doubt, but do the companies and regiments attending them come so trained as to be able fully to profit by them?

The drill books lay down now no normal formations for war. The fact is the details of minor tactics at present are unsettled and have been so for some time past. Troops can therefore only be efficiently trained by such action as Dragomirow's, that is by officers of reading and experience taking up the matter and showing possible combinations in the varying circumstances of war.

Again is every manœuvre so carefully explained beforehand that say, at least every commissioned officer understands exactly what is about to be done? It is not my experience. Much less that the regiment as a body has a fair idea of it.

Von Mach brings his paper to a close in the following words:—

"To conclude, I give a sample of how Dragomirow invites his officers to study. "However much has been said," he says with reference to his directions; "it is still insufficient. Even the fullest and most detailed instructions leave gaps and something unexpressed; therefore we must not confine ourselves to the regulations and instructions, but we must read, read, and read; for choice, the detailed works on military history and performances of those who have not only been engaged in war themselves, but have written of it.

"Specially make yourselves acquainted with the work of that ever memorable man our great Suwarow. Only if you are penetrated with his spirit will you acquire the art of speaking with the soldier simply, intelligibly and from heart to heart.

"But whatever you read take nothing from any one as granted. Never quiet yourself with the thought, so and so says so, therefore it is true. But put to yourself this question: why does he so speak? When you have found out this "why" or the author has given it to you with his arguments, then you can rest satisfied, and then his idea becomes yours, for you have yourself travelled the same road by which the author arrived at it. If however you have not discovered the "why," then do not believe what the author says, even if it was Napoleon himself."

"I believe we can declare ourself in harmony with these words" concludes von Mach, "whatever we may think of Dragomirow's ideas in details."

"STONEWALL" JACKSON,

By Lieutenant D. M. Bower, 2nd (Q. O.) Bengal Light Infantry.

One of the most interesting characters of the American Civil War is "Stonewall" Jackson. General Lee refering to him says that, "Such an executive officer the sun never shone on." Lord Wolseley who was a spectator on the Confederate side expresses his opinion that, "with such a leader men could go anywhere and face any amount of difficulties. I believe that inspired by the presence of such a man I would be perfectly insensible to fatigue, and reckon on success as a moral certainty. He is idolized with that intense fervour which consisting of mingled personal attachment and devoted loyalty, cause them to meet death for his sake, and bless him when dying."

At the battle of Fredericksburg he appeared in a magnificent uniform presented to him by Stuart. "Ah, general," said one of his impudent rebel boys, as he rode along the line, "You need not try to hide yourself in those clothes; we all know you too well for that." The love of the rank and file for him at that time was almost idolatrous, and it steadily increased to the close of his career. A more grandly impressive sight was never witnessed than that of the greeting of his men on that bright morning at Fredericksburg as he passed in his gay clothing on his fiery war steed. These hardy veterans, all of them ragged, and many shoeless, sprang to their feet from their recumbent position, and waved enthusiastically their dingy hats and soiled caps; but refrained from their wonted cheers lest they should draw the fire of the enemy's artillery on their beloved chief.

The brilliant Confederate leader, General D. H. Hill writes.—"Long before "Stonewall" Jackson had risen to the height of his great fame, he had won the implicit confidence of his troops in all his movements. "Where are you going?" one inquired of the "foot cavalry" as they were making the usual stealthy march to the rear. "We don't know, but old Jackson does," was the laughing answer. This trust was the fruit of past victories, and it led to other and greater achievements."

At Jackson's funeral a mutilated veteran from one of his old divisions was seen anxiously pressing through the crowd, to take his last look at the face of his beloved leader. They told him that it was too late, that they were already closing up the coffin for the last time, and that the order had been given to clear the hall. He still struggled forward, refusing to take a denial, until one of the Marshals of the day was about to exercise his authority to force him back. Upon this the old soldied lifted the stump of his right arm and said—"By this arm which I lost for my country, I demand the privilege of seeing my general again." It is needless to add that the request was granted.

Regarding Jackson's capabilities as a leader it may be said that he was one of the greatest masters of ambuscades and surprises since the days of Hannibal. With 13,000 men he had defeated an aggregate of 64,000 in thirty-five days, marching 245 miles and gaining four desperate battles. These were certainly the most rapid and brilliant operations of war since Napoleon had cut to pieces Blucher's army on the Marne in 1814. "When the small means, the trivial losses, and the short time with which this great result was wrought are considered, it may be admitted that military genius has never in any age, accomplished more splendid achievements." *(Dabney.)*

The following extract from the *Richmond Engineer* will be found very interesting.—"Never defeated or out manœuvred on a single field, but always victorious, regardless of the numbers against him, or the position of the enemy, always knowing the most assailable points of his antagonist, and ever ready to strike, he has been likened, in the sudden and irresistible force of his assaults and their persistence, to the violence of the hurricane, the destructive sweep of the western tornado, and the fierceness of the tiger for his prey. While in the attack on Howard's camp at Chancellorsville, his last and most brilliant achievement, we have the testimony of a Federal general to the sudden and desperate character of the surprise, which can only be compared to one of those terrible prairie fires in the west so vividly described by writers of American fiction. It is said of the charge of Balaklava, "This is splendid, but not war." Jackson's flank movements and charges were the very perfection of artistic warfare, and there could be nothing to equal them in splendour."

In the discussion of military affairs the mastery of his genius was equally apparent to competent judges. When these topics were introduced his mind assumed its highest animation, he disclosed a knowledge which surprised his auditors, and his criticisms were profound. One instance may be noted. In the summer of 1856, he employed his long vacation in a European tour, in which he visited England, France, and Switzerland. During this journey he carefully examined the field of Waterloo, and traced out upon it the positions of the contending armies. When he returned home, he said that although Napoleon was the greatest of commanders, he committed an error in selecting the Chateau of Hougomont as the vital point of attack upon the British line; it should have been the village of Mont St. Jean. This opinion has subsequently been corroborated by high authority in the military art.

At the battle of Fredericksburg he said, "I am opposed to fighting here. We shall whip the enemy, but gain no fruits of victory. I have advised the line of the North Anna, but have been over-ruled." What Jackson here anticipated occurred to the letter.

As to the value of study in forming a great leader it may be said of Jackson that he rode to battle at the head of the class he had been teaching at West Point Military Academy. As a strategist the first Napoleon was undoubtedly his model. He had studied his campaigns diligently and he was accustomed to remark with enthusiasm upon the evidences of his genius. He said that he was the first to show what an army could be made to accomplish, and to replace the old technical art of war with the conceptions of true science. Napoleon had shown what was the value of time as an element of strategic combination, and had evinced that good troops, if well cared for, could be made to march twenty-five miles daily, and win battles besides.

Jackson's celerity of movement was a very simple matter. He never broke down his men by too long continued marching. He rested the whole colum very often, but only for a few minutes at a time, and he liked to see his men lying flat on the ground to rest, saying, "A man rests all over when he lies down."

"Invidious critics have attributed many of Stonewall Jackson's successes to lucky blunders, or at best to happy inspiration at the moment of striking. Never was there a greater mistake. He studied carefully (shall I say prayerfully) all his own and his adversary's movements. He knew the situation perfectly, the geography and the topography of the country, the character of the officers opposed to him, and the number and material of his troops. He never joined battle without a thorough personal reconnaissance of the field." *(General D. H. Hill.)*

No soldier was ever less indebted to luck; no one ever proceeded in military matters upon profounder logic. He did not look to numbers only, but to morale, the situation, and the spirits of his troops. With the three hundred of Leonidas, he would have attempted great things; with the fifty thousand survivors of Napoleon's Grand Armée, crushed in morale by Waterloo, he would have attempted nothing. If his men were on fire with ardour, and the enemy though treble their number, were disorganised by surprise, or for other reasons, he would advance to the assault without fear of defeat.

It is mainly to study and reflection that the greatest captains of the world's history owe their immortal fame. Lecturing on this subject Colonel Henderson states that:—"If an officer has been accustomed to deal with military problems even on paper, the powers of his mind and his natural ability will have been strengthened in the right direction, and the process of reasoning, which the solution of difficulties involves will come easier to him than the man who has to depend in all the excitement of battle on a rusty intelligence, and the chance of a happy inspiration. The despatches of Wellington, Napoleon, and Moltke, prove that they depended for suceess on their hard thinking and careful calculation. In fact those magnificent strokes of genius which seemed dictated by the circumstances of the moment were due, as Napoleon himself implies, to a habit of calculation so rapid and so accurate as to seem to the uninitiated like an inspiration." By far the most important cause of success in war is good leading or, as Chabrias puts it, "better an army of stags led by a lion, than an army of lions led by a stag."

"It is a significant fact that during the period of the Peninsula and Waterloo campaigns, those magnificent soldiers, when neither Wellington nor his great Lieutenants Hill and Graham, commanded them, were unable to win victories. Pakenham with a force of these veterans whom Wellington declared could go anywhere and do anything was decisively defeated by the American Militia at New Orleans. Other veterans were beaten by their own general at Plattsburg. The unfortunate expedition to Walcheren, undertaken in the same year as Corunna, cost the army the lives of thousands without a single success to compensate: in the same year 5,000 English soldiers were driven out of Egypt by the Turks; and the campaign in Holland in 1814, although conducted by Lord Lynedoch, was not fortunate. It is a melancholy fact that throughout the great war the army suffered in its leaders."

Jackson's health was far from good. As a youth an obscure disease of the stomach and digestive organs had seized upon him, harassing him with chronic prostration of the nerves, sleepless nights, and lassitude. Notwithstanding the means used to re-establish his constitution, these symptoms assumed the more ominous form of a slight paralysis. The latter, however, wore away after a time; and about his second year at West Point his system seemed to be relieved of some of its burdens. But the other affliction clave to him like a Nemesis during his whole youth and the war with Mexico, and never relaxed its hold until after he came to Lexington, as professor in the Military Institute, when he subdued it by means of the alum springs of Rockbridge in connection with his admirable temperance. His habits of uncomplaining endurance, and modest reluctance to every display savouring of egotism, concealed the larger part of these sufferings. It should be remembered, in order that we may appreciate his capacity and energy, that his arduous studies at the Military Academy, and his brilliant services in Mexico, were performed by him while tormented from time to time by his wretched disease. So delicate was he that he never indulged in tea, coffee, tobacco, or alcohol. He had to live on stale bread and butter-milk, and to wear a wet shirt next his body. Nothing would induce him to stop up after nine o'clock. When boarding at a public hotel, these peculiarities attract much attention, and he was much laughed at by the rude and coarse. But he bore all their jests with patience, and pursued his plan unmoved by their laughter.

He was a man of weak nerves but no timidity. "I think he loved danger for its own sake and gloried in battle." He would not let any appetite control him or any weakness overcome him. He would go all winter without a cloak in the mountains of Virginia, "giving no other reason than that he did not wish to give way to cold" This self denial and self control explained his wonderful success. He had conquered himself and was made fit to be a conqueror. This contest with self, began in childhood and perfected in manhood, culminated in those splendid victories which electrified the world.

He was intensely ambitious and aspiring and thirsted for knowledge. A remark of Dr. White that "in our country the man who can speak multiplies himself by five," made a great impression upon Jackson, and be resolved to become a speaker. He had never made a speech in his life, and was remarkably diffident. But he had determined to succeed and his iron will prevailed. "I well remember his first effort," writes Dabney,—"He rose with a determined aspect, and never did resolution sit more grandly upon his brow when charging a battery than it did on that night. But his health was poor and his nerves unstrung, and he betrayed much embarrassment. The town paper, in describing the exercises, referred to the nervous speech of Major Jackson, coarsely and unfeelingly putting the word "nervous" in italics. Jackson, however, persevered. He joined the Franklin Debating Society. He succeeded in making an impressive, but never a ready speaker. I think that his conduct was due in this case to a determination which he had made in early life to conquer every moral and physical weakness of his nature. He had a feeling from early childhood not to yield to difficulties and trials."

The following quotation further illustrates his iron will. "Jackson was no lover of garrison life. When offered the position of professor in the Military Academy of Virginia, he promptly accepted it. He afterwards explained to an intimate friend that while campaigning was extremely genial to his tastes, the life of a military post in times of peace was just as repulsive; that he perceived the officers of the army usually neglected self improvement, and rusted in trivial amusements at these fortresses; and that on the recurrence of war, the man who had turned with a good military reputation into the pursuits of a semi-civilian, and who thus vigorously prosecuted his mental improvement, might expect even more promotion in the army than those who had remained in the dull tread mill of the garrison. But he declared that he knew war to be his true vocation and that his constant aim in life would ever be the career of a soldier, that he only accepted a scholastic occupation during peace, and that he was mainly induced to do this by the character of the school, and by the opportunities which, as professor of the art of the artillerist, he would enjoy of continuing his practical acquaintance with his chosen calling. He therefore repaired to the Military Institute in 1851, and in this honourable retirement spent nearly ten years. When subsequently asked by a friend (after his success had long been assured) whether he had not been diffident of himself in undertaking so tried and arduous a task as instructor, he replied, "no, he expected to be able to study sufficiently in advance of his class; for one could always do what he willed to accomplish."

One of the most painful consequences of his ill health was a weakness of the eyes, which rendered reading by an artificial light injurious, and threatened total blindness. This infirmity was not usually revealed by any visible inflammation, but rather affected the nerves of vision. He made it a conscientious duty, as well as found it a necessity, to forego all reading after nightfall. But as the hours of daylight were necessarily much occupied with the duties of the class room, the drill, and the faculty, this deprivation of the quiet hours of the night, which most scholars find so precious, was a serious difficulty, and imposed upon him a peculiar method of study. During the part of the day which remained after the morning recitations, he carefully read over the texts of the subjects which he wished to study for the next day, fixing the outlines of the discussion in his retentive memory. He completed the studies of the morning without lamp, book, or diagram, either pacing the floor of his chamber, or quietly seated with his face to the wall. In this mental review he passed over every link of the logic of the discussion, completed its method in his own mind, and assured his perfect recollection of it, so as to be prepared to teach it on the morrow."

"One can comprehend how valuable was the training which Jackson's mind received, in these meditations without book upon abstract truths for work as a soldier. Command over his attention was formed into a habit which no tempest of confusion could disturb. His powers of abstraction became unrivalled. His imagination was trained and invigorated, until it became competent for grouping the most extensive and complex considerations. The power of mind to endure its own tension, in the labours of reflection and volition, was drilled like the strength of the athlete. His self concentration became unsurpassed. Having fixed upon his mind the position of his forces, and of the enemy's, and the relations of the routes, rivers, mountains, and fortresses, by the inspection of a map, he could study all the possible combination of movements as he rode, wrapt in thought, at the head of his columns, with as much maturity as though alone in his chamber. Hence, in part resulted, that while no commander could give more scope to his own versatility and resource in the progress of events, there never was one whose foresight of events was more complete. Nothing occurred which had not before been considered in his mind, no possibility was overlooked; he was never surprised.

The following incident of the Mexican war well illustrates Jackson's pluck as a young subaltern. "He had been pushed forward until he found himself unexpectedly in the presence of the enemy, at so short a range, that in a few moments, the larger portion of his horses were killed, and his men either struck down, or driven from their guns by a storm of grape and shot; while about seventy of the infantry were holding a precarious tenure of the ground in his rear. Worth was just completing his detour, and bringing his veterans into connection with his party, when perceiving the desperate position of Jackson's guns, he sent him word to retire. He replied that it was now more dangerous to withdraw his pieces, than to hold his position; and that if they would send him fifty veterans, he would rather attempt the capture of the battery which had so crippled his own. Magruder then dashed forward, losing his horse by a fatal shot as he approached him, and found that he had lifted a single gun across a deep ditch by hand, to a position where it could be served with effect; and this he was rapidly loading and firing, with the sole assistance of a sergeant, while the remainder of his men were either killed or wounded, or crouching in the ditch. Another piece was soon brought over and in a few moments the enemy was driven from his battery by the rapid and unerring fire of Jackson and Magruder."

"When the arrival of re-inforcements relieved him of his danger, he displayed his ready resource in pursuing the defeated foe, where any other officer would have felt fully justified in busying himself only with carrying the shattered remains of his command to the rear. His friends asked him if he felt no trepidation when so many were falling round him. He replied, "No, the only anxiety of which he was conscious in any of these engagements, was a fear lest he should not meet danger enough to make his conduct under it as conspicuous as desired;" and as the fire grew hotter he rejoiced in it as his coveted opportunity. He also declared to those who were surmising the effects of the dangers upon their spirits, that to him it was always exciting, and that he was conscious of a more perfect command of all his faculties, and of their more clear and rapid action, when under fire than at any other time. This it will be remembered was a distinguishing feature in the character of Napoleon's celebrated lieutenant, Marshal Ney. The Emperor was won't to say of him that he was little worth as a general, saw nothing, and could do nothing, till he was enveloped in fire and smoke. Then he was all energy, sagacity, and genius.

Let us go on, was the key to his marvellous success. "I would not have succeeded against Banks," said he to one of his staff, "had I not struck him from the moment I struck his out-posts at Front Royal. Soon after crossing the north fork of the Shenandoah, I found my cavalry halted, and a formidable body of the enemy drawn up to receive them. I knew that delay would be fatal. I ordered a charge. They hesitated," here he paused, and at length added, "but they did charge, and routed the enemy." (He himself led the charge, and hence his pause.) "I pressed them rapidly all night. But for the panic created by this rapid pursuit, I would have been beaten at Winchester." Such tactics are in accordance with Bugeaud's advice which is that, "Lorsque vous vous trouverez tout à coup en présence de l'ennemi, attaquer, car en pareil cas celui qui attaque a presque toujours l'avantage."

He never made entrenchments. None knew better than he the axioms of the military art which finds the logical end of defence in surrender. His ideas sympathised always with those of the Douglas, who "preferred rather to hear the lark sing, than the rat squeak." His genius never shone when under the command of another. "It seemed to be then shrouded or paralyzed." Macgregor on his native health was not more different from Macgregor in prison than was Jackson his own master from Jackson in a subordinate position. He once wrote to Richmond requesting that he might have "fewer orders and more men." That was the keynote to his whole character. The hooded falcon cannot strike its quarry."

At the commencement of the war he was strongly in favour of invading the north. After Cold Harbour, he again wished to advance, exclaiming, "The Scipio Africanus policy is the best." On the evening of the first battle of Manassas, his clear military intellect, unclouded by subtleties, hesitations, or those *pros* and *cons* which paralyse action, saw the whole field before him, and he said in his curt voice.—"Give me 10,000 men and I will be in Washington to night."

It was his maxim that in war mystery was the key to success. He argued that no human shrewdness could foretell what item of information might not give some advantage to an astute adversary and that, therefore, it was the part of wisdom to conceal everything, even of those things of which it did not appear how the enemy could make use. And since the channels by which intelligence may pass, are so numerous and unforeseen, those things which he did not wish divulged to the enemy he divulged to no one, except when necessity compelled him.

General Imboden, C. S. A., states, "Jackson's military operations were always unexpected and mysterious. In my personal intercourse with him in the early part of the war, before he had become famous, he often said, there were two things never to be lost sight of by a military commander. "Always mystify, mislead, and surprise the enemy, if possible: and when you strike and overcome him, never let up in the pursuit so long as your men have strength to follow; for an army routed, if hotly pursued, becomes panic stricken, and can then be destroyed by half their number. The other rule is never to fight against heavy odds, if by any possible manœuvring you can hurl yourself on a part, and that the weakest part of your enemy, and crush it. Such tactics will win every time, and repeated victory will make it invincible."

I have already alluded to the great popularity of Jackson with his troops; but this good feeling was mutual. When leading them to victory at Manassas he took up a position at the side of the road to watch them swing past. Referring to the occasion, an onlooker writes, "As they passed, they raised their caps, and waved them around their heads, and the enthusiastic love that beamed in every countenance, showed how hard it was to suppress the usual greeting. (The men had been ordered to march as quietly as possible for fear of their movements becoming known to the enemy.) Those who saw General Jackson that evening as he sat on his horse, cap in hand, with the westering sun shining full on his firm kind face, could not say that he was without pride. He was full of it, his face all aglow with it; but it was for his men, not one iota for himself. When they had all passed, he turned and said:—"Who could fail to win victory with those men."

I very much doubt if regular soldiers would have gained the brilliant successes obtained by the American volunteers. Mutual good will, a high order of intelligence, and good birth, are far more valuable than the smartness of the regular soldier whose service has been spent to a great extent in wasting time over the formalities of the barrack square.

Referring to Jackson's men an onlooker writes:—"At one time the phenomenon was presented of an army living for many days upon green corn and unripe apples only, during this time making exhausting marches, in incessant combats, and repulsing every assault. The troops which presented this worthy and honourable spectacle were for the most part composed of young men who had never known what it is to want even the delicacies of life. The flower of the southern youth, raised in affluence and luxury, were toiling over the dusty high ways, or lying exhausted by the road side, or fighting, when so feeble that they could scarcely handle their muskets; but a something stern and resolute in the blood of these boys seemed to bear them up, keep them to their work, and make them laugh in the midst of their sufferings." Such were the men who often had to depend for their supply of great coats, haversacks, food, &c., and even ammunition, on what they could "bag" from their opponents, and cases are recorded of their fighting on gamely with stones after they had run out of ammunition, rather than surrender or retire.

One of our most brilliant writers on the military art writes that;—"There is no action during recent years in which the losses rose so high and in so short a time, as in the American fights. At Fredericksburg, Meagher's Irish Brigade, 1,200 strong lost 963 men in the attack of the stone fence below St. Mary's heights. At Gettysburg, Pickett's division, some 4,000 strong, attacking in line, penetrated into the heart of the Federal position, with about 300 men, the remainder having fallen on the way, the survivors held on and did not run, but being unsupported eventually surrendered themselves prisoners."

"Both northern and southern troops bore, and bore victoriously, a percentage of loss, before which even the best disciplined troops in Germany, the Prussian Guard Corps, failed to make headway."

The American Civil War abounds with most interesting partisan leaders, especially those who fought on the southern side, such as Stuart, Morgan, Forrest &c. Jackson's best irregular cavalry leader was a magnificent officer. Writing about him Cooke states that. "The name of Ashby will long be remembered by the people of Virginia, who rightly esteemed him as one of the ablest soldiers of the war. He was the ideal type of the southern cavalier, pure hearted, stainless in morals, and of heroic courage and constancy In the last days of June 1861, his brother Richard, while scouting with six men on the Upper Potomac, was attacked by eighteen of the enemy, and his horse falling with him, he was cruelly bruised, beaten, and then shot and killed, almost within sight of Turner Ashby. He tried to reach Richard, and with eleven men charged one hundred, killing five with his own hand: but all was of no avail. Richard lingered a few days and then died. Turner Ashby being present at his burial, stood by the grave, took his brother's sword, broke it and dropped it on the coffin, claspsed his hands as though registering some vow, and then closely compressing his lips to prevent a sob from bursting forth, mounted his horse in silence and rode away."

He took command of Jackson's cavalry in the autumn of 1861, and his commander wrote of him:—"As a partisan officer I never knew his superior. His daring was proverbial, his powers of endurance almost incredible, his tone of character heroic, and his sagacity almost intuitive in divining the purposes and movements of the enemy."

He could scarcely drill a regiment, and the discipline which he preserved, if he could be said to preserve any with the men whom he commanded, was more like that of a chief huntsman of a hunting party than a leader of men in the field. His men almost idolized him, for they saw that he had the eye and the nerve of the born leader. "Of this beautiful nature, full of heroism, modesty, and chivalry, much more might be said, but the crowded canvas does not admit of an adequate delineation of him. The writer of this page had the honour and happiness to know him, to hear the sweet accents of his friendly voice; to look into the depths of those clear brown eyes, which never shrank before the stare of peril." *(Cooke.)*

"I was with him," says Colonel Johnson "when the first blow was struck for the cause we both had so much at heart, and was with him in his last fight, always knowing him to be beyond all modern men in chivalry, as he was equal to any one in courage. He combines the virtues of Sir Philip Sydney with the dash of Murat."

"Such was the man who had fallen in the bloom of manhood, and just as his flame began to dazzle every eye. The career of the great partisan was splendid, romantic, evanescent. He passed like a dream of chivalry. After his brother's death, a sad smile was the habitual expression of his countenance, and his life was little worth to him, for he was devoted to death and glory."

I have digressed in order to allude to the material with which Jackson gained his marvellous victories, as I deem this necessary even for a rough sketch of his career.

Perhaps the most fascinating feature of Jackson's character was his high sense of duty. "Never was there a home dearer than his own; but he left it never again to cross its threshold. From that time, as we are told, he never asked or received a furlough, was never absent from duty for a day, whether sick or well, and never slept one night outside the lines of his own command. And passing over a thousand occasions which the war affords for the exercise of his unconquerable will, there is something impressive in the fact that the very last order which fell from his lips was a revelation of its unabated force. After he had received his wound, while pale with anguish, and faint with loss of blood, he was informed by one of his generals that the men under his command had been thrown into confusion, that he feared he could not hold his ground, his voice which was growing tremulous and low, thrilled the heart of that officer with the old authoritative tone, as he uttered his final order, "General, you must keep your men together and hold your ground."

It is highly improbable that the wound Jackson received at Chancellorsville would of itself been sufficient to have caused his death. It was the wound combined with a severe cold that killed him. This cold had resulted from his kindly solicitude for the comfort of another. In the hasty march to Chancellorsville he seems to have left behind him his blankets, and one of his aides threw over him a heavy cape as some addition to his scant covering. During the night Jackson bethought him that the young man might be suffering from cold; and this cold terminated in that attack of pneumonia which, occuring at a time when he was enfeebled by his wound, resulted in his death. If he had not thrown that cloak over his sleeping aide, it is probable that he would have survived his wounds. The symptoms of pneumonia taking a turn for the worse, he became delirious, and in his restless sleep he seemed attempting to speak; and at length said audibly, "Let us pass over the river and rest under the shade of the trees," These were the last words he uttered. Was his soul wandering back in dreams to the river of his beloved valley, the Shenandoah, whose verdant meads and groves he had redeemed from the invader, across whose floods he had so often won his passage through the toils of battle?

Such was the end, so befitting to a soldier, of the leader of whom it has been said, "that he was greatest and noblest in that he was good, and without a selfish thought, gave his talent and his life to a cause that, as before the God he devoutly served, he deemed right and just."

The great cause of Jackson's brilliant career was his iron will. Nature had endowed him with less brains than the average; this deficiency he made up for by extra study. His health was poor and he was a martyr to dyspepsia, but got over it by exercising extraordinary powers of self denial. He habitually nourished the honourable ambition to make himself the very greatest of which his nature was capable. Beneath his modest reserve and silence, so contrasted with all the tricks of egotism, there burned the steady but intense purpose to place his character and his name high upon the scale of merit. Perhaps the most characteristic of his maxims is the following, written in a conspicuous place :—

"You may be whatever you resolve to be." History teaches us that great men owe much more to their character than to their brains. Referring to this subject Sir E Wood says,—" Having induced the young officer to read let him study self-command. When Marlborough was in council, and was invited to attack, and said he would not attack next day, nothing could induce him to attack, and he was called a coward in the council chamber. He said, " Yes, I may be, but I won't attack." He knew that he had somebody alongside of him who meant to pass the news on, and when he did attack next morning he challenged the officer to lead with him. This is a great instance of self-command. But that is only one quality, and the self-command which I want to impress as my view of what the young officer should aim at, is to be a better man than any one under him. I have seen man after man who is not at all clever rise above those around him by force of character. Look at Blucher, look at Clyde: these two men were certainly not clever, but they had force of character."

In conclusion, it will be interesting to notice the opinion formed of Jackson at one period of his career. Nothing is better established than the fact that the man of whom General Lee wrote, "Could I have directed events, I should have chosen for the good of the country to have been disabled in your stead," and of whom the London *Times* said, "That mixture of daring and judgment, which is the mark of "heaven born" generals, distinguised him beyond any man of his time."

Nothing is more certain we say, than that this man was sneered at as a fool and on many occasions stigmatised as insane.

We need not wonder that Jackson was so misjudged. In appearance he was like Turenne, awkward and most unmilitary looking, and like that great leader showed to great disadvantage in society, and the military pedants of his own country as readily pronounced him a bad officer as did the countrymen of Napoleon and Wellington pronounce these great captains bad officers before war had, as usual, reversed the opinions of the kindly peace critics.

HOW AUSTRALIA CAN HELP INDIA.

By **George Cathcart Craig**, Editor, Australian Army, Navy, and Defence Review.

Major-General A. B. Tulloch, C. B., before leaving Victoria expressed his regret that he would not have an opportunity of leading a Victorian Contingent to the frontiers of India in the event of a war with Russia. He had no doubt about the issue of a war with Russia, or any two Powers combined, and was convinced that the masterly arrangements of the Commander-in-Chief in India and his able staff would be sufficient to stem the tide of invasion from Central Asia: but as the unexpected nearly always happens in war, is was not impossible that a sudden call might be made on the Australian and other Colonies for troops, to replace the Anglo-Indian brigades gallantly fighting at the front. General Tulloch thought so well of the young Colonials as soldiers that he declared that he would be proud to lead them against the best disciplined troops which our enemies might employ for the invasion of India or Australia.

Since its migration to Australia, the Anglo-Saxon race has not degenerated with regard to pluck, hardihood, and martial spirit, and ever since the Crimean War and Indian Mutiny the spirit of self defence and military duty has not been foreign to the Australian popula-ation. The old, heroic, and resolute spirit, prevails in all the Colonies. The martial pulse beats as true in the Anglo-Australian as in the heart of John Bull at Portsmouth, or the British hero in the out-posts of Burmah or Chitral. As in Europe and America, a few socialists and would-be-revolutionists are present amongst the colonial population, chiefly in the large towns, but they are only flashes in the pan, with whom the thinking Antipodean quietly declines to be associated. With the exception of the rowdy socialist and his dreamy adherents, the Australian is loyal to his Race, Empire, Queen, and State Constitution, the latter freer than the British Constitution itself. The spirit of the race was aroused in 1885, when England was wrongly reported to be hard pressed for troops to fight the Soudanese Arabs, and the Russians had the latter advanced on Herat. It was not the small force of about 800 men that left Sydney for the Soudan that proved what Australia could do, or how far she was able to help the Mother Country in the hour of danger, but it was the voice of martial Australia yearning to take part in an over-sea expedition, and scatter the Queen's enemies. Only New South Wales was allowed to send military help to the Soudan, but we know that 5,000 good men and true were ready to volunteer for service, and General Tulloch was right when he said that Australia could spare a strong brigade for temporary service in India.

I differ with him as to the composition of the force, which should consist of three regiments of infantry, 1,000 mounted infantry, 500 lancer cavalry, two complete batteries of field artillery, a medical staff corps, and other necessary details. So loyal and patriotic were the people in the despatch of the Soudan Contingent, that mercantile firms and rich colonists vied with each other in donating or subscribing funds to provide extra comforts for the men. No troops in ancient or modern times went to war with such ample pay, or such luxurious stores and equipment. If the troops did not go to the front in carriages, they went in floating palaces, well found in champagne and larder luxuries. Upon the whole it would be a fallacy to suppose that a British spirit does not exist in Australia, and I feel sure that if called upon, her sons would rush to the help of their brethren in India. When Majors Forbes, Wilson, and Gould-Adams were fighting Lobengula in Matabeleland, several volunteer corps offered to help their adventurous countrymen in South Africa.

It may be said that the great Indian Empire does not need the help of Australians to repel an invasion from Central Asia. I admit this, but there is always the chance of a reverse, and the loss of prestige which the capture of Candahar or Cabul by a *coup de main*, would cause upon the natives of India, is a matter to be reckoned with by the Indian Viceroy. It is just possible that on the declaration of war in Europe the Royal Navy might not be able to shut up the enemy's warships in the French and Russian ports, and that if they steamed out to sea to fight it out *a la* Trafalgar, the result of a modern naval battle might not favour "the old flag," while the escape of the enemy's cruisers would imperil the British command of the sea. The chief aim of the Royal Navy in the event of war would be now as in the time of Howe, Hood, and Nelson, to keep the foeman's ships in their own ports, and if they should escape to sea, our ironclads must "know how to dispose of them" as old Admiral Napier once said in the Baltic.

It would be a dangerous undertaking to send 15,000 British troops through the Suez Canal or viâ the Cape to re-inforce the Indian army if half a dozen powerful cruisers such as the *Rurik* and *Dupuy de Lôme* were in a position to intercept and attack them *en-route*. It is still a moot point whether England has sufficient cruisers to protect convoys and ocean liners filled with troops for India. If she cannot do it, then away goes our proud and hard won command of the sea, of which the history has been so graphically described by Captain Mahan. If it is the intention of England, or Australia, to help India, reinforcements would have to be thrown into Bombay, Madras, or Calcutta before a declaration of war, or when the sea power of England was still paramount and her ocean lines of communication safe beyond the shadow of a doubt, as they were in 1854-55 and again in 1882. An English expedition should never be trapped at sea like the Chinese transports *en-voyage* to the Yalu. The British nation would never forgive a commander who allowed himself to be caught, and his transports destroyed in a sanguinary battle. No expedition would be safe to leave Australia without the Royal Navy having first defeated the main fleets of the two great Powers in European, Indian, and Pacific waters. The sea road to India would have to be safe before Australia could despatch reinforcements, for only in extreme cases could she afford to waste life and valour as at the reliefs of Gibraltar and Minorca. If England failed to maintain her command of the sea, the question arises, would it be wise or judicious for the Colonies to weaken their military strength by sending off a contingent of 5,000 men, the pick of their brave defenders, when the first line of Australia's defence, the Navy, was destroyed, and her shores rendered subject to raiding, invasion, or bombardment by a victorious and hostile fleet? I think it would be admittedly unwise and unsafe.

The transports conveying an Australian Contingent would require to be escorted by a fleet, and on landing in India the colonial troops would be detailed for garrison duties, thus allowing an equivalent number of Indian troops to be sent to the front. Australian soldiers have plenty of *elan* and a ready discipline, but it would not be advisable to employ them in the field until they had become accustomed to the conditions of Indian service. Australia would be able to spare the services of 5,000 men, because they could at once be replaced by 50,000 others, who, however, would require three or four months continuous training to fit them for employment against disciplined European troops.

If the greater part of the Anglo-Indian Army was wanted at the front, the Australian troops, together with the European Volunteer Corps of India, would create a deep sense of internal security in the rear, and thus reduce the chances of mutiny and rebellion. In the event of an invasion of India, Russia would employ about 400,000 men, at three or four points, and to resist such armies would give plenty of work to all the troops under the orders of the Indian Commander-in-Chief. It would be madness for Russia to attempt an invasion with less than this number, as she would have to guard against possible flank attacks from Asia Minor and Persia. We must give up all hope of a Chinese attack upon the Russian forces on the Pamirs. The £18,000,000 Chinese loan, coached by Russia, has lost England the alliance of China in that direction. Chitral, Gilgit, Peshawur, Quetta, and Burmah will, therefore, require strong Anglo-Indian Divisions as Corps of Observation. Hence the necessity of Indian statesmen and generals looking to Australia as a source of military help in time of need and danger. The Indian ports and rivers in the next great war will be liable to be raided, invaded, or bombarded in Aube fashion, and in a style similar to the ports of Australia, the West Indies, or even the United Kingdom itself. It would cause alarm to the natives of India if they heard that Herat and Bombay, Cabul or Calcutta were in the hands of Russia. The Indian ports must be strong enough to defeat such bombardments, and her harbours must be keept open as ports of refit, refuge, and coaling stations. Australia would expect Indian harbours to be kept open as lines of communication with her Contingent in India. It would go hard with India if she was cut off from England and Australia by sea. The Indian army would require our horses, coal, tinned meats, and other colonial produce in the event of war.

Amongst the ranks of the Australian Contingent would be found men fit to stand climatic change, the privations of active service, long marches, and the demands of army discipline, whilst their scouting and camp qualities would prove of the greatest value. The Indian cavalry is as good as any in the world, but an Anglo-Indian army wants more of that new arm—mounted infantry and rangers. To-day the *rôle* of cavalry will be to reconnoitre, and the *rôle* of mounted infantry will be to seize hold of, and keep, valuable tactical positions until the arrival of the main army. An Australian Contingent in India would be at a considerable disadvantage owing to the fact of the troops not being armed with magazine rifles, the new 12-pr. field-guns, the improved Maxim and Hotchkiss quick-firers, and unsupplied with high explosives and modern projectiles. These are deficiencies which the seven united colonies of Australia should make good without further delay. We are cognizant of the fact that foreign invading troops armed with Lebel and Berdan magazine rifles, and covered by Maxims, Nordenfeldts, and long range field guns, would soon dispose of our brave little armies, but we hope that the Australian troops will soon be re-armed with the Lee-Metford and the most modern types of machine, quick-firing, and field guns. If the colonial armies were so armed, 5,000 disciplined Australians should defeat 10,000 Russians, 7,500 Frenchmen, or 12,000 Japanese.

I have just received the official return of all the Defence Forces, which reviewed by my own knowledge and experience, I set down at 17,500 on a peace establishment, and 36,000 on a war footing without conscription. Taking all the existing machinery in the several colonies for the purposes of mobilisation, even adding the rifle club reserves, I do not think it safe to rely upon more than 25,000 as really high class disciplined troops, fit to meet a European invader; but it is wonderful how the quarter drilled Australian soldier can pick up the word of command, accustom himself to camp routine, and steadily perfect himself in field and battle discipline. After the mobilised federal strength of 36,000 had been called out, an ulterior force of 100,000 men would volunteer to defend the country. Three months drill and discipline would render them fit for anything.

Taking the colonial troops on a peace footing, the character of the force may be termed equal to the men who left England for Waterloo, for it has a large percentage of experienced warrant and non-commissioned officers to lead and direct the half trained rank and file. Upon a war footing the Colonial armies would not be so efficient in the field as they would only have a Militia drill. This being so, the expert, practical, and dashing Indian commander might say—"Thank you very much for your offer of 5,000 men to help India if necessary, but what use are they if they are not up to the standard of discipline of the Indian Army? We want men fit to face the hordes of Kuropatkin and the wild Cossacks of Ali Khanoff." Just so! An Australian Contingent of 5,000 men would leave Sydney, Melbourne, and other centres of population, as half disciplined men, full of military ardour and love of the British Empire; and before they reached the front they would know their work and their officers so well, that they would be fit to fall into line with either Sikh or "Tommy Atkins." Forty per cent. of this contingent would be old soldiers, many of them Imperial Reserve men, and the other sixty per cent. would be men of over three years service in the Defence Force. This contingent has no existence at present, but it could be mobilised in a week when called upon by the Queen in Council, or even, if a cablegram was received from the Viceroy of India to the effect of "Come over and help us." In a year or two when colonial statesmen will have learnt that the attack is superior and more final in war than a passive defence, we may expect them to provide a disciplined force, easily mobilized, and fit to embark upon an offensive expedition. It will be better to carry war into New Caledonia, to Saigon, Reunion, or Vladivostock, than to permit the troops and sailors of France and Russia to escape to sea, land, burn, pillage and destroy our commerce. Major-General Hutton has been the first to demonstrate a practical scheme for the despatch of a force to relieve Hobart in Tasmania, should an enemy land there. The details of the mobilisation, equipment, embarkation, and despatch of an offensive-defence force must in the same way be worked out in time of peace. A combined hostile expedition might land in New Zealand, entrench itself in Northern Queensland or South Australia, capture and hold Thursday Island or King George's Sound, make a sham attack at Newcastle or Geelong, or by sudden concentration appear before the naval base at Sydney. This would put the Admiral with his scattered command, together with the disjointed and unfederated colonial forces, in a trying position. It is true that a line of overland railway extends from Gladstone in Queensland, to Adelaide in South Australia, via Brisbane, Sydney, and Melbourne, but we could not protect Port Albany, Port Darwin, or Thursday Island from a naval bombardment. This phase of the Australian defence question demands that the colonies should have an offensive-defensive army of 5,000 men ready to embark for places which if vigourously attacked might close the war in the Pacific or Indian Oceans. Indeed, Australia *must* have that army, just as the United Kingdom *must* have the Militia, Yeomanry, and Volunteers to enable three Army Corps of regular troops to leave England for operations in India and Europe. The invasion of Australia can only be prevented by sending combined expeditions to those places which if left alone would form rallying points for troops destined to capture the colonies.

The non-military element of the colonial hustings is blind to the offensive-defence system. The labour candidate will laugh down the idea in vulgar phrases, but this over-sea armed force must be established in times of peace, and not postponed until the actual outbreak of war. The armies of Marlborough, M'Clellan, and Wellington were made during war, but the armies of Frederick, Moltke and of British India were created during peace. "Where can we get this 5,000 men" quoth the non-patriot "and even if we had them, the Parliament would not allow them to leave Australia." To this exclamation Major-General Tulloch answered. "They could be got for India, and would leave the Colonies in spite of the Government." And they would enlist, depart for, and conquer in India, under her able and heroic commanders. The departure of 5,000 soldiers would not be felt, for every commandant would be required to complete his command to war strength, and discipline the ulterior volunteer or conscript army mobilized to repel an actual invasion. If India called for help, Australia would risk dispatching the contingent by sea to defeat the invaders of Hindustan.

The Naval defence of India is closely connected with any scheme for the defence of Australia. The Royal Navy is responsible for the defeat of any combined naval attack upon Indian ports. To a large extent the safety of the Suez Canal and Red Sea, or of the Cape route is identical with Australian interests. All trade and transport for India and the Colonies passes through the Suez Canal. Mr. Laird Clowes has not yet proved the wisdom of shutting up the Levant and Suez Canal by a fleet of ships at Aden and Gibraltar, thus blocking what is by several thousand miles the speediest road to India and the East. A Franco-Russian war with England should not make us scuttle out of Egypt or the Mediterranean, as "the great naval fights to be" may just as well be fought off Malta, Toulon, or Port Said, as off Torbay, Brest, or Cherbourg. It is to the mutual interests of India and Australia that the Suez Canal should be kept open. If we cannot do so, how can we be strong enough to maintain our sea power off the Canaries, West Indies, or the Cape? If England has not the command of the sea, the Cape route may be blocked as well as that by the Suez Canal. Let the Suez and Cape routes be destroyed, then India and Australia are cut off not only from the mother country, but also from London—the key, brain, and financial centre of the Empire, if not of the whole world. This not impossible event in a naval struggle would change the theatre of war to the Pacific and Indian oceans. With such an event grand British combinations will begin on this side of the line. India could only be relieved by England *via* Vancover and Australia, and also by the joint operations of the North Pacific, China, Indian, and Australian fleets. The Admirals with one grand tactical scheme would shut up the enemy's ships in their few ports, or follow their devastating cruisers to the bitter end. It would be an easier task to do so on this side of the Equator than in the Atlantic or the Mediterranean, because, despite the 24 Russian and 16 French men-of-war now cruising in Eastern waters, the four British fleets are more than a match for the ships of the Dual Alliance. Our command of the telegraph system enables our admirals and captains to know every day the movements of each foreign war ship. With ships of the *Blake*, *Blenheim*, *Crescent* or *Terrible* type patrolling the ocean highway between Brazil and N. W. Africa, or at the mouth of the Red Sea at Aden, the India, China, Australian and North Pacific fleets should not only clear the ocean of hostile cruisers, but also be able to destroy any hostile base of operations, or any combined fleet that offered them battle. These operations would be going on whilst Sir George White and his skilful generals were waging war on the Indian frontiers, and whilst England, with or without the Triple Alliance, was fighting bravely, as of old, for her sea power and the integrity of her Empire. Our foes would at the onset try to get to sea to destroy commerce and cut the lines of oceanic communication. The duty of the Australian colonies is simply that of mobilisation and a stand to arms, with a heart for any fate, ready to defeat invasion or assume the offensive-defence. The despatch of an Australian Contingent to India, before or after a declaration of war, depends upon the circumstances of the moment. If the four fleets of England in the East were victorious in every sea, then India could depend upon help from Canada and Australia in a variety of ways. Business with Australia would be great. A war trade would spring up in horses, coal, produce, &c., especially if China, Japan, Spain and Holland were neutral; nor would it ever do to carry British goods in foreign bottoms, as it would tend to destroy the future carrying trade of England, India, and her colonies.

So much for Australia helping India. Let us see how India, if necessary, could help Australia in time of war. It is not impossible for a bold, daring, and clever enemy to land a force in Northern Australia and there entrench himself in Plevna fashion. Russia in 1885 has a plan laid for the capture of New Zealand, whilst other Powers had designs upon Fiji, Samoa, Tonga, Tasmania, and the Gulf of Carpentaria. And *supposing* that our admirals missed hostile armadas and lost their sea power in desperate battle in the vast Pacific, a Franco-Russian, or Japanese expedition could steal along the Australian coast and effect a landing at some point, far from our military centres. Our colonial armies might melt before the disciplined troops of the invaders. The fate of war, despite our inborn gallantry, self sacrifice, and obsolete harbour defences, might go against us, and then Australia might ask for Indian help, which would mean an expedition like that sent to Abyssinia and thrice to Egypt. When Japan gained command of the sea in the China war, she transported over 80,000 men from Japan, and in the present Cuban rebellion, Spain safely transported and landed 50,000 men in Cuba, to say nothing of the transit of the French expedition to Madagascar. Such facts prove what can be done by a bold and enterprising enemy. Abercrombie and Wolseley could not have landed in Egypt, Wellington in Spain, or Raglan in the Crimea, if England had not possessed command of the sea. With a foreign army entrenched in Australia and conquering our disjointed little armies by beating them in detail with superior guns, projectiles, and magazine rifles, we might have to call in the aid of an Indian Contingent to renew the struggle, and force the strangers in the bushland to capitulate. If such assistance was wanted I am sure that the Imperial and Indian Governments would grant the request, whilst the officers and men, Native and European, would be animated with a noble spirit, and with a mutual patriotic desire to defeat the enemy. The Sikh, Goorkha, Punjabi, Pathan and Hindustani in a splendid line of battle front with the genial sons of Australia, might yet capture a Cossack army on the Hawkesbuyrian as they would beyond Candahar.

Such are a few impressions with regard to how India and Australia could help each other in war. I send them to your excellent Journal as fresh food for reflection, or as that part of Colonel Maurice's bone of defence, which I think has not yet been properly picked. I touch upon items and units of a possible coming defence of England's Eastern Empire, when parts of it may be hard pressed, whilst the Mother Country is engaged by land and sea in Europe, and when parts of her magnificent Colonial Empire are cut off from India and the United Kingdom. The time is approaching when a system of defence for our scattered possessions must be thought out and reduced to an exact science. One brain may not formulate it—give it flesh, bone, sinews, or life, but for all we know there may lurk in the mind of some of England's great war sons—a greater than Caesar, Alexander, Gustavus, Marlborough, Napoleon, Moore, Wellington, Napier, or Roberts—a great, grand, and complete scheme of naval and military defence against the world in arms. The maiden thought may electrify some brain. I sitting thinking and writing at the naval base of Sydney send you my thoughts on the subject, however crude, confused, or imperfect they may be, hoping that some Indian officer will ponder over the aim and object of this paper and weave out of the web of confused ideas and loyal aspirations, a golden and serviceable cloth of perfect Imperial defence. The march of science, the development of electricity, the non-finality of invention, the revolution of steam, the tightening of the links of empire by the post and telegraph system, and the enlightenment of man in war, all demands the continuous attention and consideration of soldiers, commanders, and statesmen. The expansion of our empire compels us to keep it at any cost and sacrifice, because trade always follows the flag whether along the dark outline of the Hindu Kush, or amongst the thousand isles of Oceania.

In conclusion let us hope that in the next great war the soldiers of the Imperial, Indian, and Colonial armies will be seen marching shoulder to shoulder all united in a firm determination to maintain the integrity of that Empire which it has cost so much sacrifice and heroism to establish.

NOTES ON VOLUNTEERING IN INDIA.

By Captain W. Dennys, (26th P. I.) Adjutant 2nd Administrative Battalion N. W. P. Volunteers.

Much has been written about Volunteering, and Government thoroughly realizes the necessity of according its strong support to the movement in India. The subject, however, has by no means been threshed threadbare, so these brief notes may not be considered inopportune.

Many reforms are not only advisable, but also necessary, to make volunteers more efficient, to make the movement more of a reality, and to render it more popular amongst the non-military and Eurasian community.

My object is an endeavour to stimulate a greater interest on the subject, and to point out what *especial interest* it ought to have to every non-military man in India.

This is a country in which volunteering ought to be a real and effective force, and no mere child's play, being, as we are, in a conquered country which is held by force of arms. It should be realized that, if volunteering in England is necessary and advisable, how much more so, in fact how absolutely essential is it in India, where every European is as one to so many thousand natives of the country, where we have around us an alien people, against whom we should, each of us, have to protect ourselves in the event of any insurrection

I.—*Utility and principal objects of Volunteering in India.*

I think we all admit that India is held by military force. We all consider our hold is certain; we see plenty of troops around us, and know that our garrison strength in India is strong, and thus we feel we can live in security. But when we hear of the possibilities of a war on a big scale, or consider any other contingency which would cause the withdrawal of troops from India, do we realize what this diminution of our resources would mean? I think not. With our whole military strength around us, we have no need to fear internal troubles; it is here in ample strength to protect us; but in a war of any serious magnitude, there is no doubt but that we should be left, to a greater or less extent, deprived of this protection. The result of this would be that, in many of our smaller military stations, and rural districts, European and Eurasian women and children would be left without military aid of any any sort, and treasuries, magazines, store rooms, &c., would be practically unguarded except by the local police. The least that one might expect, under the circumstances, would be that the local city "badmashes" would take advantage of the chances of plunder and riot thus afforded.

Mutiny history, not to mention the experience we should have gained at other and more recent times, has taught us that a few resolute

Europeans, *provided they have arms and ammunition at their disposal and know how to use them*, can defy a vastly numerically superior body of unarmed, or perhaps partially armed, natives. The moral effect on the minds of natives of the knowledge that all Europeans *are* armed, is, in itself, often sufficient to prevent the occurrence of such disturbances.

The existence of discord in India, which has been, from time to time, graphically brought to our notice through the medium of the leading journals and daily newpapers, ought, if it does not, forewarn us of possible difficulties.

We have already, on more than one occasion, heard of the hearty co-operation of volunteers in the suppression of local disorder, and the excellent services rendered by them; as an instance I might mention the work done by the Behar Light Horse. We know that the number of Regulars available for service abroad, is, to a great extent, regulated by the number of efficient volunteers borne on the rolls in India, and how, in this way, volunteers can materially strengthen the hands of Government.

If all non-military men in the country were volunteers, had arms and ammunition in their possession, and knew how to use them, we should have a greater feeling of security at home in the knowledge that there were men, throughout the land, able to help themselves, and protect defenceless women and children; and think what happiness this knowledge would be to military men employed on service out of India, whose wives, children, and relations they had left behind them, not having been able to get them out of the country? Then again, we might reasonably expect better work from the local armed police, if the police officer in charge had the support of the other European residents in the locality.

"No Regulars available," was almost a stereotyped reply, during the Mutiny, to applications from the civil authorities for succour.

A book, entitled "The adventures of the Khaki Rissalah during Mutiny of 1857," narrates the excellent work performed by that little corps, (acting as mounted infantry, and only numbering about 50 in all) in and around Meerut.

We read of many instances, during the Mutiny, of small parties of resolute Europeans attacking, and completely routing vastly superior numbers of natives. Taking one example, we read that, on the 30th June 1857, Mewatees, and other Mohamedans of the city of Koel, numbering 500 to 1,000 men, attacked Mr. Watson's party at Aligarh. Mr. Watson *with his eleven volunteers*, charged them, and they fled losing 14 killed.

By the services of volunteers in those troublous times communications were kept open, and time was not allowed the mutineers for the establishment of any form of rebel government or organisation. Besides, one can see that the moral effect of small bodies of Europeans living in the open fields, marching, halting, and attacking, when and where they pleased, must have had a good effect on the population, and shown them how vastly inferior they were to those they were attempting to crush.

Do we not all feel that the services of Regulars should not be required to protect those who ought to be able to protect themselves? Would not, I ask, a true Englishmen feel that he had failed to do his duty, would he not be ashamed, if, in times of emergency, (not being a volunteer, and consequently not having the means of defence at his disposal) he was obliged to seek protection, not only for his wife and children, but also for himself, at the hands of men who *were* volunteers, who had the necessary means available, and who would always be ready and willing to maintain the glorious traditions of which Englishmen are so justly proud?

I would add that I am strongly of opinion that every able-bodied European and Eurasian man in India should be compelled to be a volunteer, for a certain number of years at any rate. At present, however, there appears to be no move in this direction, and indeed it could only be brought about by the determination of the non-military population itself, if it is to continue to be considered as *volunteering*.

Without entering into any other arguments, (and there are many) surely the above remarks are sufficient to convince all non-military men *that it is their duty* to join a movement which is such a necessary safeguard to themselves and their families.

II.—*Objections often raised against Volunteering in India.*

In my endeavours to enrol volunteers, many and varied reasons have been brought forward, as excuses for not joining, by means of which men seem able, very easily, to satisfy their own consciences. The following have been some of the chief reasons given :—

Some say, "I have sporting rifles, guns &c., in my possession, and by constant practice, would guarantee that I could shoot as straight as the majority of trained volunteers." Such a statement is not uncommon, and may be quite true, but is it a reasonable excuse? An examination of the stand of arms in this sporting gentleman's possession might reveal one or two express rifles, a rook rifle perhaps, and one or two shot guns. Further examination might disclose a very limited supof ammunition for the above weapons. Seldom, I think, is more than a very limited supply of such ammunition kept available. It is quite reasonable to suppose that he could not get more in time. How long then, in an emergency, would his ammunition last him? A sufficiency of M. H. ammunition, on the other hand, is available in nearly every station in India, and is generally reliable, but only one M. H. rifle per volunteer is authorised. In a very short time therefore, our sporting friend would be defenceless, whilst a volunteer, in the same locality, should have the means at his disposal for a fairly protracted resistance. Then again a man, in order to become an efficient fighting unit, must be trained in other things besides the actual use of his rifle. A trained volunteer should know something of drill, discipline, fire control, &c., and, in an emergency, would consequently be a better man all round than our sporting friend, who would only be a hindrance, and little better than a helpless woman, for he himself would have to be defended.

I have heard the excuse :—"I have been a volunteer in my younger days, knew my drill and learnt to shoot then ; why therefore should I devote my leisure time, which is very precious, to volunteering now ?" From whence again would this man procure the means of defence in times of difficulty ? A Government rifle and ammunition might not then be available for him, and then of what benefit would his previous knowledge be ? Again, unless he is very unlike the vast majority, he would have forgotten all, or nearly all, of what he may once have known, and without constant practice it is next to impossible for a man to shoot well.

Many point out the difficulties on account of their official duties, and the want of time to devote to volunteering, and urge that unless they can see their way to do the thing thoroughly, they prefer not to do it at all. I think we are all well aware that there are often great difficulties under this head, but, in the majority of cases, the men concerned are quite ignorant of what is really demanded of them as volunteers. Nine drills, and to qualify in musketry, is surely not much to do in the whole year, and yet this is all that is required, (though the minimum) in order to become an efficient volunteer. If then, only nine drills in the year have been attended, even the slight knowledge gained is surely better than none at all, and the performance of the musketry course every year must necessarily improve a man's shooting. A trained volunteer moreover, is allowed to have a Government rifle and thirty rounds of ammunition in his possession, which, in itself, is no slight advantage.

European and Eurasian residents at many of our small out-stations often say that they have not sufficient numbers, and volunteering becomes, under the circumstances, a farce. I think everyone will acknowledge it is even much more important for all men in such small stations, (where no Regulars are immediately available), to become trained volunteers and have Govrenment rifles and ammunition in their possession, than for men who live in our larger stations, where troops are nearly always located. In the former case, when difficulties arise, the men *must* defend themselves, their wives, and families, until help arrives, and, in order to do so, they *must* be in possession of rifles and ammunition. With reference, however, to the difficulty of affording instruction to volunteers in our smaller civil stations, where the numbers are so few,. (which no doubt is, at present, a very serious and real one) I am of opinion that this difficulty could, to a certain extent at any rate, be overcome, if volunteers would put their pride into their pockets, and turn out for drill with the local armed police. Much more real and efficient work could be performed, volunteers would have a chance of getting to know the local armed policemen, and could form their opinions as to what they were worth, whilst the armed policemen themselves would soon realize that volunteers were better armed, were better men all round, and encouraged and commanded by all the European residents in the locality, would be much more likely to do good and efficient service in case of emergency. Volunteers should not lose sight of the fact that, in the event of disturbances, they would *have* to work in conjunction with the armed police, as long at the latter remain staunch and true. This being so, why not work with them in times of peace? In our dealings with Asiatics we cannot adopt half-hearted measures. The armed police, like the men of the Native Army must be trusted all in all, or not at all. It was these half hearted measures that so often brought us to such grief in 1857. I know, as a fact, that the mutiny the Kotah Contingent, in that memorable year, was brought about by distrust on our part in the first instance, when the men might have been trusted, and afterwards, having knocked all spirit and confidence out of the men, we reposed implicit trust in them, with the result that the Contingent mutinied to a man!

Not a few in Government employ have said to me :—"I am not, *strictly speaking*, a volunteer at all. It is not of my own free will that I have been enrolled, I have been obliged to do so by the official pressure that has been brought to bear upon me." This is, I regret to say, often too true. No doubt, with a great many, the term "Volunteer" is a misnomer for the reasons given. Many men either cannot, or more often will not, realize their own responsibilities. They cannot be persuaded to look ahead, and, in times of peace, make preparations for troublous times that may follow. They are perfectly content to live in the false security of the present as happily as they can, and allow the future to take care of itself, arguing that when the time for action comes the Britisher always can, and will, rise to the occasion. I would, however, ask such men, "If you are not, strictly speaking, a volunteer, why are you not? You know, or should know, the absolute necessity for it." I feel convinced that, whatever the replies might be, they could be met with many and convincing arguments in favour of the necessity.

Others again, in a discontented spirit, have said to me :—"Government does not hold out sufficient inducements to the volunteers." The word inducement, when thus applied, usually means pecuniary help. Knowing the financial embarrassment of Government just now, no further money concessions can be looked for, but at the same time there are, I think, other means by which Government, without occasioning any, or at least very little, additional expense to the State, might raise the popularity of the movement. Many such means have been, from time to time, brought prominently to notice, and it is not my intention to enumerate them in detail now. It may not, however, be out of place to refer to a concession which, whilst adding no extra expense to Government, would be a great boon to a large number of volunteers in India, and one which would be greatly appreciated by them. I refer to railway passes on Government State Railways. For instance, a volunteer on production of a certificate signed by his commanding officer or adjutant showing that he had put in five years of continuous efficient service, might be allowed to travel second class, on payment of third class fare twice a year, and so on, proportionately greater concessions being made for longer service.

But I am convinced that the majority of those who urge that Government does not hold out sufficient inducements, do not properly realize what is really done by Government for volunteers, or what is expected of them in return. To put it briefly :—At very considerable cost Government allows capitation grants, provides free instruction, gives the volunteer a rifle and ammunition and provides him with uniform. He gets, moreover, further inducements in the shape of prizes for shooting &c., and all that is asked in return is that volunteers should learn how to defend themselves, and should be able to protect the defenceless. Surely then, under the circumstances, Government has a right to expect every able bodied non-military man in India to be a volunteer?

Some members of the Indian Civil Service have said to me :—"In case of disturbance, as Judge, Collector, or whatever civil appointment I should be holding at the time, my work would be in the district, and would be purely civil work." Well and good, *as long as law and order prevailed*, but when it no longer existed, when the authority of the civilian had to be maintained by force alone, what then? The reply to the query in the latter contingency usually is :—"Oh, force of circumstances would then compel me to become a volunteer." A very simple solution of the difficulty no doubt, but certainly not a practical one, for the simple reason that a rifle and ammunition might not then be available for him, and instead of being an assistance, his presence amongst the volunteers might be quite the contrary, and all the more so owing to his official position. The same might be said to all other men in civil employ who plead that, in case of emergency, their work would preclude them from being volunteers. The example moreover, set by men of local standing and influence joining, and taking a real and lively interest in volunteering, is, in itself, an incentive to their subordinates to follow the example set by their superiors.

III.—*Organization.*

Let us now consider which is the best, and most practical arm and organization for volunteer corps in India; in doing so, however, the undernoted points should be borne in mind :—

(*a*) The enormous extent of the land, and the huge distances to be covered.

(*b*) The absence of railways in many localities.

(*c*) The difficulties of transport.

(*d*) The climatic influences on Europeans by long exposure and fatigue.

(*e*) The absolutely fatal error of inaction, especially when dealing with Asiatics.

(*f*) The moral effect of prompt punishment on the minds of natives, and the advantages gained by such action.

There are at present four differently armed and equipped organisations :—(A) Volunteer Infantry, (B) Volunteer Cavalry, (C) Volunteer Mounted Rifles and (D) Volunteer Artillery. I will exclude, however, for the present, the last named (D).

(A).—*Volunteer Infantry.*

The large majority of Volunteer Corps in India are now Infantry pure and simple.

The *advantages* of such an arm, over others, are briefly :—

(i) Increased range, and possibly greater accuracy of rifle fire.

(ii) Perhaps greater efficiency in fire discipline and control, due to the fact that more attention is generally devoted to this portion of training with Infantry, than with Cavalry or Mounted Rifle Volunteers.
(iii) Less expense.
(iv) Power of united action.
(v) Great power of attack and defence.

The disadvantages are:—

(i) Want of mobility, and consequent loss of valuable time in getting from point to point.
(ii) Extra fatigue caused to men generally unaccustomed to marching, and corresponding deterioration in the accuracy of fire.
(iii) Longer exposure to sun and heat, and the injurious effects therefrom.
(iv) Inability, in many instances, to inflict prompt punishment.
(v) Less knowledge of the ground in the vicinity of head quarters, owing to the fact that the majority of volunteers cannot spare the time to travel far on foot.
(vi) No immediately available means of transport.

(B).—*Volunteer Cavalry.*

Advantages:—

(i) Great mobility.
(ii) Power of inflicting prompt punishment at long distances, *under favorable conditions of ground and locality.*
(iii) Power of patrolling roads, and keeping open communications at long distances.
(iv) Quick transmission of information.
(v) Powers of reconnoitring over a large extent of country.
(vi) Powers of pursuit, and thereby confirming victory over a disorganized enemy.
(vii) Less fatigue and exposure.
(viii) Power of united action, when mounted.

Disadvantages:—

(i) Greater expense.
(ii) Inability to work over bad ground.
(iii) Inferior fire power, fire control, and fire discipline.
(iv) Shorter range of fire.
(v) Larger mark for fire of enemy.
(vi) Want of transport for supplies, &c.
(vii) Inferior attack and defence power when dismounted.

(C).—*Volunter Mounted Rifles.*

Advantages:—

(i) Mobility.
(ii) Powers of inflicting prompt punishment under almost all conditions.
(iii) Powers of patrolling roads, and keeping open communications at long distances.

(iv) Quick transmission of intelligence.
(v) Powers of reconnoitring a large extent of country.
(vi) Powers of completely routing a beaten foe.
(vii) Little extra expense.
(viii) Ability to act over bad ground.
(ix) Less fatigue and exposure.
(x) Increased accuracy of fire due to the men having been less exposed to climatic influences and fatigue.
(xi) Powers of attack and defence when dismounted.

Disadvantages:—

(i) A less number of rifles in firing line than infantry and a proportionate inferiority in attack and defence.
(ii) Less united action than either cavalry (when mounted) or infantry.

Now what is especially wanted is well organised *Mounted Infantry* for Volunteer Corps in India, an arm which, as I hope to show, (with certain alterations in the present organisation of Mounted Rifle Corps) would add the following advantages to those already noted for Mounted Rifles:—

(i) Adaptibility for transport.
(ii) Having got quickly from point to point, the power of then acting as Infantry.
(iii) It would not be necessary to bring means of locomotion under fire of enemy.
(iv) Longer range of rifle fire, being armed with the M H. rifle.
(v) Power of united action, though inferior to Infantry, and to Cavalry when mounted.
(vi) No extra expense.

Cannot something therefore be done to combine the valuable qualities of the two arms, cavalry and infantry? We should not doubt it but for an absurd weakness in military human nature, for you have only to put an Englishman in uniform, upon a horse, call him a mounted rifleman, and forthwith he will be nothing short of a dashing cavalier!

The tendency of mounted rifles, as at present constituted and organised, is, gradually, to resolve into bad cavalry. This, I am sure, will be generally admitted, and it is, I think, a very natural consequence. Mounted drill, in the majority of cases, is very preferable to dismounted. The thought of being a cavalryman, carries with it a halo of swagger and glory which is most gratifying to human vanity. If, under present conditions, there exists the smallest loophole, no other result than good mounted rifles deteriorating into bad cavalry can be anticipated. I am not aware of a properly organised volunteer mounted infantry corps in India at the present time. There are a few corps which are called Mounted Rifles, but I have been given to understand that the members do *not* consider themselves mounted infantrymen, in spite of the ruling of para. 2, A. R. I., Vol, IX, as amended by I. A. C.—12 of 1890, and para. 357 A. of A. R. I., Vol. IX, as amended by the same I. A. C. Their drill, mounted and dismounted, is a modified form of cavalry drill; they are armed with M. H. carbines, whilst mounted infantry should be armed with M. H. rifles. Para. 45, A. R. I., Vol. IX, moreover, divides the units of a Mounted Rifle Corps into Section, Half Troop, Troop, Squadron, &c. If therefore, Government intends that there should be a distinction between mounted rifles and mounted infantry, (I am not aware of this being clearly laid down any where) there is all the more reason that an authorized drill book should be published for mounted rifles, which should be quite distinct from the Mounted Infantry Regulations now existing.

I again repeat that what is especially wanted is *mounted infantry*, well organised, for volunteer corps in India. The proper organisation of such forces in India appears to me of the greatest necessity, but then such mounted infantrymen must be made to understand clearly what is the real part they are to play on emergency. War is no time to commence such an organisation. All such matters should be attended to whilst tranquility exists.

In order therefore to overcome the tendency of Mounted Rifles deteriorating into bad cavalry, I would suggest that the appellation Mounted Rifles be only retained for purely Mounted Rifle Corps, that is for corps which Government recognizes are *not* Light Horse or Mounted Infantry, but which have a distinct and authorized constitution and organisation of their own, and which adopt the modified form of cavalry drill. Mounted Rifle Regulations, clearly specifying the constitution of, and the drill, to be adopted by such corps (and quite distinct from the Mounted Infantry Regulations), should therefore be published forthwith, and rigidly adhered to. No such regulations at present exist. I would further suggest that the majority of purely infantry volunteer corps in the plains, be converted into mounted or mobile infantry, or, at least, be allowed to maintain mobile infantry detachments, consisting of one or more companies, and organised somewhat in accordance with the views expressed further on. All members of such corps should be made to understand that well organised and equipped, mobile or mounted infantrymen are the very best infantry in the world, combining, as they do, mobility with fire power, and that they only differ from Infantry pure and simple by the fact of their being in possession of the means of rapid locomotion from point to point, whereas infantry do not possess such advantages. Taking into consideration the great distances that would have to be covered in India, the mobility gained by being mounted, and the advantages of having their own ekka transport for supplies &c., is of the highest importance.

One of the greatest difficulties in the proper organisation of Mounted Rifles is in the matter of ponies or horses. Each member belonging to such corps is supposed to keep a horse or pony in his possession. A large majority of volunteers cannot afford to do this, and the result is that great numbers, who would otherwise willingly join such corps, are debarred from doing so.

Now when I try to describe the arm I think of the most practical use, and best adapted to the various conditions of service amongst volunteers in India, and call this arm and organisation mounted or mobile infantry, I am aware that I shall subject my remarks to severe criticism, and perhaps ridicule from many. I cannot, however, allow such adverse criticisms to deter me from my object, namely, to give a brief outline of an organisation, which I think is deserving of serious consideration. It differs from the present organisation of Mounted Rifles in the following respects:—

(*a.*) I do not consider it essential that every man should be in possession of a horse or pony.

(*b.*) Those members who have not such means of locomotion in their possession, should be allowed to hire local transport, such as ponies, traps, ekkas, mules, camels, &c., the hire being defrayed out of Capitation Funds.

(*c.*) That, in order to secure the mobility of the men, the use of transport of *any* description, (not excluding bicycles), be freely allowed.

(*d.*) That the men be armed with M. H. rifles.

(*e.*) That (except in regard to a very few of the rudiments of cavalry drill, for the members who elect to ride on horseback) the men be trained as infantry pure and simple.

A number of volunteers mounted in such ways would, no doubt, present rather a ludicrous appearance, but if, by such means, the men are able to get quickly from point to point, (which they cannot hope to do on foot) and when they have arrived at their destination, (perhaps many miles from head quarters) are less fatigued, and consequently better able to fight, surely we cannot, in these days, allow appearance to interfere with practical utility.

Let us now consider what points are gained by the use of the means of locomotion above referred to.

First.—Many more mounted, or mobile infantry volunteer corps could be formed than, at present, exist.

Second.—There would be very little, if any, extra expense to Government. (as I hope further on to point out.)

Third.—Supplies could be taken out with the men, and no extra transport would be necessary, a very great consideration,

Fourth.—The country ekka, being light, and fit to be taken over the worst "kutcha" roads, coupled with the facts that next to no weight bears on the ponies' backs, that the ponies are generally hard, and inured to fatigue, great distances could be covered in one day.

Fifth.—The country pony will thrive on an incredibly small amount of food.

Sixth.—Prompt punishment, at a distance, could be inflicted.

Seventh.—Men would be much better acquainted with the country in the vicinity of head quarters.

Eighth.—Much fatigue, and loss of time, would be saved.

Ninth.—The tendency towards conversion into bad cavalry would be avoided.

It may be argued that, in times of emergency, hired ponies, ekkas, &c,, might not be available. That such things exist in almost every locality will, I am sure, be admitted, If so, there is a simple answer to such an argument. The willingness or otherwise of the owners would

I think, hardly be considered. The means of transport would be seized, and the owners would receive a fair remuneration.

Suppose then a riot is reported in a village 15 or 20 miles from the nearest volunteer head quarters, that there is no railway, no Regulars are available, and that a prompt suppression of the riot by volunteers is necessary as the local armed police are unable to quell the disturbance. Suppose again that there is a company of 70 volunteer infantrymen at head quarters, 50 of whom are available for the work to be performed. What would naturally happen in such a contingency? Would the 50 men, (unaccustomed to long marches) march out 15 or 20 miles, at a moment's notice, and be fit for hard work at once at the end of the journey? I think not. If they did march, what arrangements would be made for their food and supplies? Either one of two things must happen:—

(*a.*) The prompt suppression of the riot, and punishment of the offenders, could *not* be carried out, or

(*b.*) The 50 men wonld, at once, start off on ponies, traps, ekkas, or other miscellaneous means of locomotion, taking their supplies with them, and, in all probability, would be able to attain the desired object with promptitude.

Now an arm, (infantry pure and simple) which precludes the possibility of the first of these two things being accomplished, must be a very faulty one; whilst if the men act as noted in the second contingency, they cannot be properly called infantry volunteers; they are, in fact, nothing less than volunteer mounted or mobile infantry.

If what I have briefly alluded to in the second contingency is what would naturally take place, surely it would be more advisable, in times of peace, to recognize such an organisation, and train the men oftener *to work together* as mobile infantry?

Lord Roberts has said, "When you meet an Asiatic, go for him, and when you have got him on the run, keep him so." Yes, but our men must be mobile in order to do so!

I must explain that my remarks about mounted or mobile infantry have had reference, particularly, to volunteering in the plains, and especially to those places where a large majority of the volunteers cannot afford to keep horses or ponies themselves. The organisation of volunteer corps in the hills cannot, of course, undergo much change, nor would many changes be advisable. It is, nevertheless, I consider, absolutely necessary for every hill corps to have a section, half company, or company of mounted infantrymen (mounted on ponies or horses whether private property or hired) for the purposes of reconnaissance, and also a section of 10 or more signallers. Of course, in such cases, wheeled conveyances are quite out of the question. It is hardly necessary, I think, to point out the great advantages of having a mounted or mobile infantry company or detachment in *all* volunteer corps. The patrolling of roads, keeping open communications, reconnoitring, &c., &c., could be so much more efficiently, and quickly, performed, that it hardly admits of discussion.

If therefore, in a company of 50 volunteers in the plains, (exclusive of officers,) say 9 men were in possession of ponies, and 5 or 6 men had private traps, I would distribute the company of mobile infantry as under :—

1 Sergeant, and 8 volunteers on horses or ponies (private property)	= 9
1 Sergeant, and 8 volunteers, (hired)	= 9
1 Sergeant, 2 corporals, and 8 volunteers, in private traps (2 or 3 per trap)...	=11
1 Sergeant, 2 corporals, and 18 volunteers, in ekkas, hired (2 or 3 per ekka)...	=21
Total	=50

This distribution would provide a small advance guard, with scouts, and a small rear guard, all being mounted on ponies or horses.

These men should carry their rifles slung on their backs, like mounted infantry. I have reason to believe, however, that their arms could be carried with much greater comfort to themselves, if the slings of the rifles, instead of being fixed on to swivels at the upper band and near trigger guard, were fixed on to swivels, placed, one beneath the lower band, and another near the toe of the butt.

I do not consider it necessary that the numbers detailed for each particular means of transport should be rigidly adhered to, but I think that, in the majority of cases, for a company of 50 volunteers in the plains, the proportion of men with private means of conveyance to those who must hire such means, would be found to be approximately as noted. Endeavours should be made however, to preserve complete tactical units as far as possible.

It may not be out of place here, whilst discussing the advantages of mounted or mobile infantry over infantry pure and simple, to make a few further remarks.

The Volunteer motto :—" Defence not Defiance," is the expression, no doubt, of sound practical feeling ; as a military maxim, however, especially when applied to volunteers in India, it is nonsense. If there is one point on which professional soldiers are unanimous, it is that, in the long run, the only effective defence consists in attack, and the highest ideal of defensive generalship is an action in which the defender delays his attack until the adversary is exhausted. The idea, engrafted on the minds of many, that defence, in itself, serves as an operation of war, has had disastrous consequences. It has led to the neglect of many military preparations that might be available for attack, and a preference for the means of passive defence. The result has been a style of training for volunteers, which, as it is does not fit them to take the field, renders them as helpless for defence at home as they are supposed to be for attack abroad. The essential elements of combative strength are mobile, and no efficient preparation for defence is possible, that will not also serve for attack.

The probable cost of a minimum of 5 drills per annum on the mobile infantry system advocated, out of the 9 drills now required by Regulations, (and I think this should suffice) would be :—

	Rs. per annum.
9 hired ponies @ Rs. 1 per diem for each pony ...	× 5 = 45.
Say 10 hired ekkas @ Rs. 1 per diem for each ekka	× 5 = 50.

or a total cost of nearly Rs. 100 per annum.

The capitation earned by a company of 55 volunteers, (including 3 officers) might reasonably be expected to amount to Rs. 1,455 per annum, calculated as under :—

33	N.C O'S. and Volunteers	earn	"extra efficients"	grant	@30 = 990
17	„	„	" efficients "	„	@20 = 340
3	Officers	„	"proficiency"	„	@25 = 75
2	Sergeants	„	„	„	@25 = 50
55			Total Rupees per annum	...	1,455

out of which amount at last Rs. 300, (or three times the above estimated cost) might be wisely, and judiciously, expended in giving the men the practical and useful training such a method would afford. The increased expenditure would at the same time, provide for the possibility of none of the members having private means of locomotion, and still leave a balance, which should be sufficient to meet current expenses during the year.

The above figures will, I think, show that the system advocated of hiring ponies and ekkas is quite feasible.

Chief civil authorities of districts might with very great advantage to every one, encourage the introduction of a slight modification and improvement in the common district ekka. It is very unlikely that any modification or alteration would be generally adopted by ekka men, that was not of the simplest, and most inexpensive nature. The improvements suggested, therefore, are in themselves very simple, and would certainly make the ekka much more suited, than it now is, for military purposes. It so happens that, at present, a great number of ekkas have no splash boards at all; others have a projection of 2 or 3 inches, flush with the seat, but, only in a few and exceptional instances have I seen these splash boards project beyond the tires of the wheels. The consequent discomfort for Europeans seated in such ekkas, is more easily imagined than described. All I suggest, therefore, is that splash boards should be made to project sufficiently far, beyond the tires of the wheels, to avoid discomfort. This, in my opinion, would be secured if they were made to project at least four inches beyond the tires of wheels. The axle boxes serve as steps into the sides of the ekka. A step and foot rest, about 6 or 8 inches broad, should be added about 1½ feet below the rear seat of the ekka, thus enabling a third man to sit comfortably in it, when necessary, and still leave room for the driver seated in front. The additions and modifications suggested would not in any appreciable way interfere with balance or lightness.

I am convinced that what we know, by experience, was the proper and true method of dealing with Asiatics in warfare at the commencement of this century, is equally applicable now. Witness Lord Lake's energy, and rapidity of movement, especially the effective organisation of his cavalry—a compound of fire and speed, ably seconded by the courage and endurance of his scanty but indomitable British infantry, which beat down all opposition, and showed the wily Mahrattas that neither superior numbers or speed in evasion, could protect them from British power.

Now, in the time of perfect peace, is our opportunity for facing and solving this problem, the proper organisation of the Volunteer Force in India, instead of allowing its forced and hasty settlement to come upon us in the midst of some tremendous crisis. Now is the time with the object that a sound economy in one direction may give us the opportunity of greater development in another; now is the fitting, and absolutely necessary time to seriously consider whether or not a system can be devised, in the military organisation of the volunteer force in India, which shall, in case of another outbreak, give us the means of quelling it without the necessity of drawing upon our main military strength at home. Indeed, I believe we have been given to understand, that we must discard all thoughts of assistance from home.

We can, I think, better discuss this question by briefly reviewing certain well known incidents in former campaigns, say those of 1803 1806 and 1858-1859, and placing broadly side by side what *was* done with what *might have been* done under different management, in order to show how, under certain circumstances, *which may any day occur again in the future*, a different organisation would have given, and consequently may yet give us, infinitely greater advantages. The modes of action employed by Lord Lake against Holkar, for instance, when his cavalry chased Holkar's hordes of mounted men from point to point, accomplishing very long marches, sometimes 50 and 60 miles within 24 hours, never allowing Holkar's men time to gratify their insatiable desire for loot and plunder, and finally coming up with them, surprising them, and practically almost annihilating them, as he did at Fattehgarh, these exploits, I say, can compare most favourably when placed side by side with the strategy and tactics employed, as a general rule, in 1858-1859. No doubt in the first phase of the Mutiny, until the fall of Delhi in 1857, and the so-called first relief of Lucknow had taken place, the fight of our race, which was simply a stern, resolute struggle for existence, was made in a manner that redounds as much to the credit of their hearts and heads, as to their hands. When, at last, Lucknow had been relieved in December 1857, and Cawnpore rescued from the Gwalior Contingent, Lucknow still remained to be captured, and Oudh and Rohilcund to be cleared from armed rebellion. I will not touch upon the brilliant and masterly operations under Sir Hugh Rose, for the re-establishment of British power in Central India. This was in good hands. But on the latter part of this period, on the operations which followed the capture of Lucknow, undertaken for the re-conquest of Oudh and of Rohilcund, our enquiry as to the relative value of speed and numbers in Indian war, bears with particular significance. From the siege of Lucknow, (as also after the insurrection at Meerut in May 1857) the rebels escaped almost untouched to carry rebellion elsewhere, despite the cavalry we had available in the field. It was evidently thought hazardous to launch our cavalry alone in pursuit, unsupported by infantry; and the very inconsiderable power our cavalry, as individuals, possessed, in a great measure justified this reluctance. If a system, that should give either or both of our cavalry or infantry the destructive power of ordinary infantry fire, had then existed, if, in other words, there had been available mounted or mobile infantry, well organised, the wholesale escape of rebels could not have happened.

Havelock's force, when he started on his weary march from Allahabad in July 1857, consisted of about 1,300 Infantry, 8 guns, (drawn by wretched teams of bullocks) but only 18 British horsemen! By strenuous efforts he succeeded, on the march, in raising this little band to 70 sabres. The escape of the sepoys opposed to him was the inevitable result of the want of mobility on the part of the force he commanded. In March 1858 there was an abundance of excellent British cavalry in the field. As before, there appear to have been two reasons for not employing them as they might have been, (*a*) inability to act alone, and (*b*) want of fire power. Whatever the reasons may have been, the mounted arms were not, in 1858-59, utilized in the prominent way they might have been. We know what Lord Lake would have done under similar circumstances. Thus in the campaigns of these years infantry rates of movement controlled the general mobility of the forces employed. To the slowness and dreary length to which the operations of the Mutiny were dragged out, after it had passed the stage of stand-up fighting, may be attributed the failure of our mounted branch in inflicting the wholesale slaughter it might have done had it been more actively employed. I do not, however, for a moment mean to infer that there were not numerous instances of good work performed by cavalry in these years. Sir Hope Grant's attack by cavalry on the flying rebels, after the battle of Cawnpore in December 1858, is an instance. In this engagement he inflicted severe loss on vastly superior numbers, captured the whole of their guns, and his own force had no casualties in men, and only one horse wounded. *His infantry arrived too late to take any part in the engagement.*

Sir Robert Napier's achievement against the army of the Peshwa at Jowra Alipore, is another instance. With one battery of native artillery, one regiment of British cavalry, and a few native troopers, in all numbering only about 600 men, he charged, and completely dispersed the rebels, numbering about 6,000, and took all their guns, 25 in number, with very slight loss on the British side.

There are no doubt many other instances, but they are the exception, and not the rule, and, at any rate, only tend to prove that the same results that Lord Lake obtained in 1803-6 might have been achieved more frequently in 1858-9, if the employment of cavalry or mounted infantry had been oftener sanctioned and encouraged by those in authority.

The rebels, after the taking of Bareilly, again escaped almost un scratched. This was once more owing to our want of mobility.

The escape of the Nana, across the Raptee, into Nepal territory, could not have been effected, if we had had even two companies of mounted infantry with Lord Clyde's force that went in pursuit.

Had there been two or three companies of mounted or mobile infantry, combining mobility with fire power, in Meerut on the eventful 10th May 1857, the probabilities are that the rebels would never have reached Delhi, without having been engaged by British cavalry supported by mounted infantry, and this would have allowed time for slower moving arms, including the 60th Rifles, to come up in support. This would have completely disconcerted the rebels on foot, to say the least, whilst the British cavalry, with the mounted infantry and horse artillery, would have chased the 3rd Native Light Cavalry into the very walls af Delhi, and, having done this, the chances would have been a hundred to one against Delhi, the centre of the hopes of the disaffected in India, ever falling into the rebel's hands.

Mutiny history will tell us of the excellent services rendered in and around Meerut by the Khaki Rissalah, which was a small body of men, only 50 all told, composed of civilians, clerks, and many other non-military classes, how they being nothing else really than mounted infantry, scoured the country north, south, east, and west; chased, and attacked vastly superior numbers of rebels, and in every instance their exploits were crowned with complete success. If even this little force had been in existence on the 10th May 1857, there is no knowing that they might not have been the cause of preventing the majority of rebels from Meerut reaching Delhi, as they did, practically unopposed; but if there had been one of three or four times the strength then at Meerut, there is no doubt I think, that they could have accomplished this, supported, as the presumably would have been, by British cavalry and horse artillery, and just think, for a moment, what the effect of such prompt action would have been, the thousands of lives, and the amount of money and property that might have been saved? When we come to seriously contemplate all these things, is it not more than criminal for us, knowing the present organisation of the volunteer force to be lacking in this very respect, *i. e.*, want of mobility, is it not, I say, almost suicidal for us to imitate the apathy of the native, and do nothing to rectify it? When moreover, as I have endeavoured to show, this can be done *without practically any extra expense to Government*, (and it is only the matter of extra expenditure that can be a reasonable excuse forourwillingnessto profit by experience) we are, I contend, doing nothing short of courting disaster in the future, if we refuse, in the present, to act according to what we know to be, not only wise and expedient, but absolutely necessary.

If all our British infantry regiments in India had one, or even two companies, out of the eight, organised and equipped as mounted infantry, there is no doubt they would be very much more serviceable and efficient for active service than they now are; but to do this we should have to incur a large outlay in the first instance in providing ponies, saddles &c., for the men, to say nothing of the extra expenditure in maintaining them afterwards.

With volunteers in the plains, however, this argument does not, and need not, hold good. Many volunteers have their own ponies, and would, I think, be most willing to utilise them. Ponies could be hired for others for instructional purposes without drawing any extra capitation money. The remainder could be most usefully mounted on hired ekkas, private traps, bicycles, &c., and for such purposes again there would be no need to draw any extra capitation grant.

Space will not allow me to enter, in detail, on the subject of *training*. Like organisation, it requires remodelling. No doubt the description of drill laid down for recruits and trained volunteers in A. R. I. Volume IX, requires great latitude in execution, but, as it becomes a question of how best to afford the most practical and useful instruction in a minimun number of drills, (and the minimum is indeed very small, and cannot, I think, judiciously, be increased) it would be most advantageous to specify more clearly what special branches of instruction should, when possible, be afforded, as a standard syllabus of training to guide and assist both instructors and volunteers.

To discuss this very important subject of training, we should have to consider:—

(*a.*) The class of instruction now generally given..
(*b.*) The manner in which it falls short of requirements.
(*c.*) The means of making it more practical and useful.

We cannot entirely dispense with "Ceremonial," still less can we afford to exchange solid practical utility for sham showiness.

Very briefly therefore, for the present, I would urge the necessity of:—

(i.) Reducing purely "ceremonial" to a minimum.
(ii.) Dispensing altogether with battalion drill, which would never be required.
(iii.) Giving, generally, more practical instruction. I cannot, now, enter into details in regard to the manner of carrying this into effect.

I hope that what I have already said about volunteering in India may create honest and wholecome discussion, and, as a consequence, be the means of bringing about certain reforms.

At any rate volunteers may be sure that they have no warmer friends than officers and men of the Regular Army, and that if they receive friendly criticism, they are only in the same case with the other services. If they were of no value as soldiers, little would be said about them. It is because they have already done so much, and done it so well, that professional men interest themselves in their future success.

NOTES ON RECONNAISSANCE.

By Captain H. B. Vaughan, 7th (D. C. O.) Bengal Infantry.

MacGregor Memorial Medallist.

In these notes the endeavour is as much as possible to avoid what has been already laid down in text books on the subject, and to confine them to the points on which those books give little or no information.

The notes embody what was gradually found out by the writer during the years in which he was engaged in practical reconnaissance work, and it is hoped they may prove useful to those who have not had similar opportunities.

The first difficulty that presents itself during extended work over a tract of country several hundred miles in extent is that of choice of scale.

The traveller has probably been accustomed to work at, 6, 4, 3, and possibly 2 inches to the mile, putting in as much detail as possible and making good tactical maps. If he now attempts to work on any of these scales he will find his daily rate of progress painfully slow, and the prospect of his work being completed in a reasonable time, say 250 to 300 miles a month, very remote. In a country where the direction of the rivers, and mountains; the towns, their positions and the roads connecting them, are either partially or entirely unknown, the information so laboriously acquired would be of but little value. He should endeavour to give an accurate idea of the geographical features as enumerated above, for which a very much smaller scale will suffice.

Four miles to the inch will shew these and yet not be too small a scale to plot on, while for positions or anything else of importance he can use the scales he is accustomed to. Such a map would, supplemented by a detailed report on the country travelled over, be of greater value than any on a larger scale which only took in a mile or so to each flank of the route, beyond which would lie *terra incognita* to him who was seeking information from it.

Considerable difficulty will probably be found at first in working on this unaccustomed scale: so much that was formerly put in has to be omitted, and shots have to be taken at hills miles away, in a manner that would never previously have been thought of. Towns one was accustomed to shew the houses of will now be represented by a dot or a small circle, while lofty mountain chains that one would previously have attempted only a small portion of, shewing contours and watercourses, will now be put in by a few cross bearings to the highest peaks and their general run indicated by a line of shading.

Some practice at this scale is advisable before starting, as when travelling there are numerous other things to which a considerable part of ones attention has to be given. If working with a plane table the reconnoiterer can use the same, or a smaller scale, 8 miles to the inch. This latter takes in a lot of country and avoids the necessity of constantly changing ones plane table sheets, while at the same time it admits of a fair amount of accuracy. The sheets for the plane table should be wetted well and when *nearly* dry,—not soft enough to tear, should be placed on the table and turned down round the edges, and the part that overlaps pasted on to the under part of the table, and weights placed on the pasted portion till it is dry. The paper when dry, will be as firm and tight as a well strung drum. Don't pin your sheets, the pins are sure to work loose after a few days use and get lost, also the wind gets under the sheet and blows it up and down while you are working, and moreover, if you pin it by pins on the top of the table they obstruct the free working of the sight ruler, which if placed on the top of a pin does not lie true; with pins too, working out, your sheets are almost certain to get torn.

To paste the sheets on, boil some rice, and when cold, work it up into a paste: it make an excellent fastener and is also colourless. Tint your sheets pale blue or green with a wash of water color, before fixing them. This saves the eyesight and enables you to see the map clearly in the strongest sunshine. The alternative is to use an umbrella, but this is inconvenient when baggage is limited and one has only one attendant who is holding the horses. Use a needle to pivot your ruler on. Needles are brittle and through sometimes breaking off in a hole, cause inconvenience; to remedy this, heat their points to a red heat, after which they will remain pliable, while a lump of sealing wax stuck on the head will prevent them from sticking into ones fingers. It is said that surveyors dispense with a needle, and pivot the ruler against the pencil point, but without incessant practice one would be liable by this method to take shots occasionally from the wrong point and so spoil one's work.

A good plan is to have a sheet of tracing cloth fastened over the top of the paper, but removable.

When the weather is fine you can work on the sheet of paper, when wet, fasten the tracing cloth down over it, and work on its surface, the original map shewing through. As all the points are pricked through, this causes no inconvenience, and the tracing cloth being always fastened down over the paper, when the table is put into its bag, prevents the map getting rubbed. If mounted when moving, the table can go into a bag on the sowar's saddle, while the legs are placed across the bow of it, or carried in a bucket on the off side, with a strap fastened to one end of them and round his arm. After a little practice he will be able to set it up, level it fairly well, and place the ruler and compass ready for use.

As regards the method of working with the plane table, it will be found in the text books, and there is also a great deal of useful information in a book published by the Royal Geographical Society, entitled Hints to Travellers.

Many prefer the plane table to the compass, and find that it can always be used, unless great rapidity or secrecy in working is necessary. But it is not advisable to use it on extended reconnaissances unless one has had a good deal of preliminary practice, and is thoroughly familiar with it.

Sometimes when working by notes with the compass only, and arriving at a point from which a great number of bearings can be taken, it is a good plan to set up the table, and take a circle of rays to all prominent objects in view, and then resume work in the note book. Afterwards when plotting the work with a protractor, the sheets can be utilised by transferring the rays taken on to the compass work. It is no doubt the quickest and most accurate way of taking a large number of bearings from one point.

As regards the method of working let us take the case of an officer going on a reconnaissance through a friendly country, which is very imperfectly known. He has been supplied with the best maps that are available, which shew, however, but little ; we will conclude that he has studied all available books regarding the country, the people, and their manners and customs ; that he knows the language or has secured a good interpreter ; has got his kit and instruments together, and, lastly, has had clear instructions as to what sort of information and maps are required of him. He arrives at his starting point, which may be a frontier town, or sea port of some foreign country. In the former case, he has points fixed by the Indian Survey to start his work from, while in the latter he has the Admiralty Surveys of the coast, as an accurate base to commence with. Taking his map he finds a blank of some hundred or more miles, in the direction he proposes going, but with some town marked on it in that direction. He then sets to work by questioning the inhabitants to find out what roads, and how many there are leading from there to it; the stages, their length, watering places, villages &c., upon them. Upon a sheet of paper on which he has marked his starting point and the town shown on the map, he proceeds to put down the routes as gathered from the inhabitants, allowing an inch or a quarter of an inch for their unit of measurement, which may be days, *kos*, *farsakhs*, or any thing else ; he also puts down the cross roads from halting places on one route to those on another, and thus gets the different roads laid down in their relative relation to one another, and thus gradually works out, a rough map of the country. The best people to get information from, are the muleteers, camel drivers, and villagers, also the merchants and traders who employ them. Governors and officials as a rule either know or pretend to know nothing. Some will try purposely to mislead one, but will very soon be detected by questioning. A route given substantially the same by two or more separate people may be accepted as correct.

It is wonderful how accurately information as to the relative distances and positions of places can be thus obtained.

This rough map completed, the traveller will be able to select his route and make suitable arrangements for transport, provisions, and guides. As he is mapping &c., he will be sure to fall a long way in rear of his transport during the march, and it will be advisable for him to carry some provisions, both for himself and his horse, overcoat, lights, and water, in case he or his transport lose the road or fail to turn up at the appointed halting place. Always have two guides, one for yourself, and one for the caravan. Guides have been known to lose the road before now, and there are other things that may happen ; a landship may block the road, or a river may rise in flood between you and your transport.

As regards information about supplies, the traveller will probably find that he has been taught nothing that could aid him in that respect. A good plan at first will be whenever be meets a herd of cattle or a flock of sheep to estimate their number and count them to test its correctness ; after a little practice he will get so accurate that the counting may be dispensed with. At first he may proceed in the same way with villages and small towns and will soon be able to make a very fair estimate of the number of the houses and inhabitants A very good plan to estimate the cattle of a town or village is to go to a hill or ascend to some roof top close by, shortly before sunset, and see the herds and flocks coming in. In this way one can learn not only their numbers but also where their grazing grounds and watering places are. Ask all the caravans met on the road where they are coming from, what they are carrying, and their destination. This together with conversations with the merchants gives one some idea of the trade.

As regards the state of the country one is moving through, the inhabitants may say it is disturbed or unsafe, but if the cattle are seen grazing, the women working in the fields, and travellers singly and in small parties moving along the roads as usual, one may be fairly sure of its being safe.

It is perhaps hardly necessary to observe that, in a desert country where water is scarce, its exact quantity should be carefully noted. It is useful to carry a stout string about 60 feet long leaded at the end in one holster, for sounding wells. The full measurements to be taken are (1) Its diameter if circular, if square its area. (2) Depth of well, surface of ground to its bottom. (3) Distance from surface of ground to surface of water. (4) Quality of water, and if halted, the time it takes to refill, the latter being ascertained by finding the distance to the surface of the water after drawing a supply for the animals, and remeasuring it some hours later. With tanks or cisterns, their cubic capacity, and whether supplied by rain, springs, or streams must be noted, and also the supply of firewood. It is also advisable to take readings of the temperature, some may think this of no importance, but on it depends the amount and nature of the clothing required by an expedition, the selection of the time of year for military operations, and also the rate of marching.

In most towns the streets are at right angles, or nearly so, and a fairly accurate map of a town can be made unobserved by taking advantage of this fact in the following way. Carry a card or slip of paper up the left sleeve or in your glove, and as you ride through the streets, make a pencil mark on the paper indicating the road you are travelling up, and write the number of minutes you are in it against it ; when you turn to the right or left make a line in that direction, and note the minutes against it, and so on, making a conventional mark as you pass any public or important building. If previous to this, you have by a triangulation outside the town fixed the positions of the mosques, palaces, forts, and towers, the results will be satisfactory.

The circumstances under which a reconnaissance is made when moving through a hostile country with an armed force are far less favorable than in the preceding case, where halting places and routes were all chosen with regard to facilitating the work, whereas now one has to keep up with a column possibly making long and forced marches, and whenever one leaves the column one has to be accompanied by a strong escort. Previous to starting with a column, if the country were unknown, one would act in the way already described, making a hearsay map, and collect any other information one could by rapid reconnaissances, and from natives. As regards mapping, there is seldom time when on the march to do any elaborate work, while if the country is thickly wooded it becomes impossible to do any. In such a case the best thing to do is to keep a route by time and compass, in a pocket book, in the manner about to be described.

It may frequently happen too when the reconnoiterer is travelling by himself that the work has to be carried on with great rapidity. This may be owing to long marches made from one watering place to another when they are a great distance apart, or a detour from some unforeseen cause being necessary, making the journey longer than was anticipated and supplies therefore falling short; or again the unfriendliness of the inhabitants may make it necessary to push on; or hostilities may break out between the tribes or villages through which one is passing. In such cases it will be found that the only practicable way of carrying on one's work is by compass, time instead of pacing, giving the measurements. It is a system that has been adopted by numbers of travellers and explorers and is one of those used by the Intelligence Branch. The only improvements here attempted are, an easy method of rapidly making a number of various scales for use in plotting, and tables from which the equivalents of time, yards, miles, or portions of miles can be seen at a glance, and written or plotted as may be desired. The tables and scales will be found at the end of these notes.

For the benefit of those who have not worked on this plan, it is briefly described here.

The only things necessary are a pocket compass, without a prism but having the needle fixed under the card so that it revolves with it, the card being divided up to two degrees. This is used for taking short bearings of a mile or so, or the general direction of a river, valley, or mountain chain. Also a prismatic compass for taking long bearings, or for use during halts. Both compasses should of course be adjusted to read the same, a simple process, performed by removing the card from one of the needles, and refixing it again in such a place that both compasses read the same.

Previous to starting, the traveller should test his pace, over a measured distance, on level ground, and up and down hill over various gradients, noting what time he takes in each case. If riding, the same at a walk, trot, canter, and gallop, though the last three will not be so often required. The time taken in each case should be noted down in his pocket book.

When starting, he takes the bearing along the road he is going as far as he can see, takes bearings to any other points he wishes to fix, notes the time, and starts. As soon as he changes his direction he takes a fresh bearing noting the time, the time he halts, and marches on. At any of these halts he can take bearings again to the other points he took from his starting place and thus by a rough triangulation fix their position. After a little practice he need only halt every other time that he changes his direction, taking one back angle to where the direction was changed, and one forward to where he is going, though he notes the time at every alteration of his course, and simply records his bearing, as for instance 10-30 halt; back angle to 10-0 160°; forward angle 45°; 10-32 march.

If riding, he will find after a little practice that it is unnecessary even to dismount to take his bearings of the road, and general directions of valleys &c., a horse very soon learns when he is required to stand still. In taking these bearings the horses head being first turned in the direction of the point to be observed, the compass should be held about as high as the breast, till it is steady; the observer then looks at the compass reading, and glances rapidly upwards at the object to be observed. After a little practice he will find he can take bearings by this method, which are within a degree or two of what would be recorded by a prismatic compass, and are consequently of sufficient accuracy for rapid work of the nature of that he is engaged on, for the small scale on which he is plotting, and the short bearings he is taking. It is best for writing on horseback to have a pocket book about half an inch thick with a hard cover, with leaves the size of a half sheet of note paper, and a pencil attached by a string, and to write with the book held by the left hand, and between the third and fourth fingers of the right, leaving the other three fingers free, and to write only on that which at the time is the thickest portion of the book. An india rubber band to hold down the leaves written on, and to mark the place, is an advantage, as is also a cape in wet weather which to a great extent protects one's book. For all long and important bearings one should dismount and use the prismatic compass.

Sometimes when the heat is very excessive, or owing to sickness or other causes, it may be necessary to make a march at night. On such occasions it will be of some use to get the country ahead described to one, and by day-light to make a rough outline of all the hills and prominent objects in the direction one is going, marking their bearings and names, or lettering them, getting a bearing of the direction of the place one is going to as shewn by the guides, and the direction of the road as far as one can see. Starting about sunset, or a little before, as soon as it gets dark one can take the bearings of one or more prominent stars towards which one is travelling, and so note the general direction, while if travelling eastwards or westwards a certain number of the hills that were sketched by daylight, can be fixed by noting at what time their peaks come under the Pole Star. If the moon is up and in such a position that it casts a shadow, by watching its direction it is possible to tell if one is still travelling on the same bearing or not, and a fresh one is only necessary when the shadow shifts its direction, or after the lapse of some time. At the halting place next day, the hills passed during the night and roughly fixed, may be in sight, and bearings taken to them, also observations for latitude. This kind of work is of course unsatisfactory, but at the same time it is better than nothing.

As regards the system of keeping notes, the simplest plan is to put everything down in one's pocket book as soon as observed. Thus the traverse will be mixed with notes on the road, water, supplies, and other information learnt en route. At the end of the march, this can all be entered in ink in a book, the right hand pages of which contain the notes and bearings from which the road will be plotted and the map worked out, the left hand pages everything else. The notes written on horseback should, for convenience, be much abbreviated; a number of these abbreviations will soon suggest themselves to anybody so employed. One or two are given here as an example.

$$+\,300^\circ\,\left.\begin{matrix}8\\ \overline{30}\\ \overline{0}\end{matrix}\right\}45^\circ\text{ dry W.C. 7-40 H. }b.\ a.\ 90^\circ\text{ Temp. }60^\circ\text{ Bar. 27.}$$

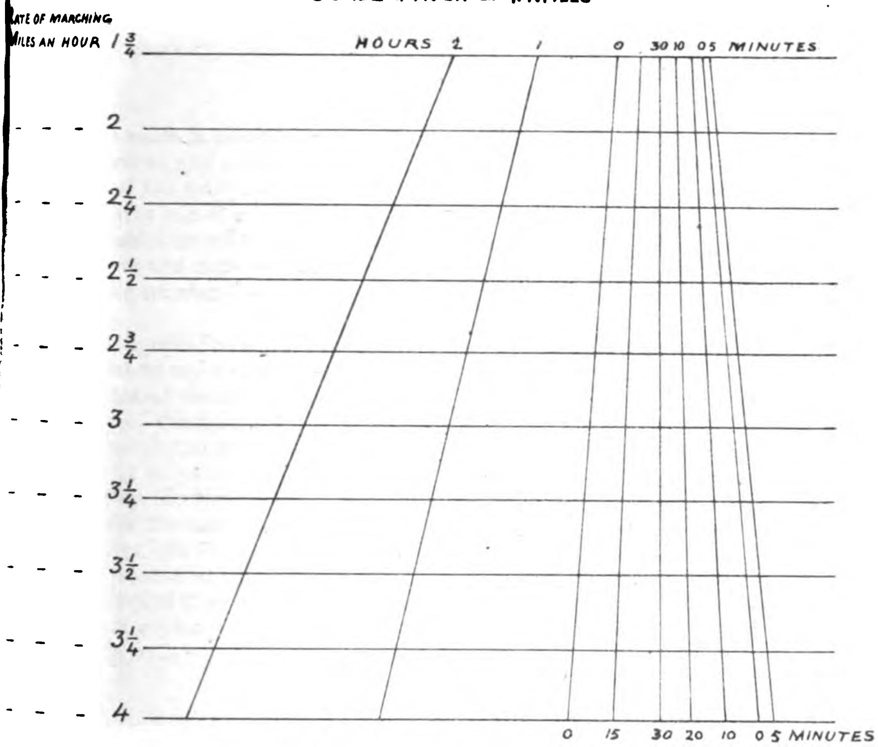
7-45 M. 8° 8-10 C. D. Which means:—Cross a dry water course coming from 300° and going in direction 45°, 30 feet broad, right bank easy, left bank 8 feet high. 7·40 halt, back angle 90°, Temperature 60°, Barometer 27. 7·45 march 8°, 8·10 change direction.

Note.—The Scales and Tables referred to in the text will be found overleaf.

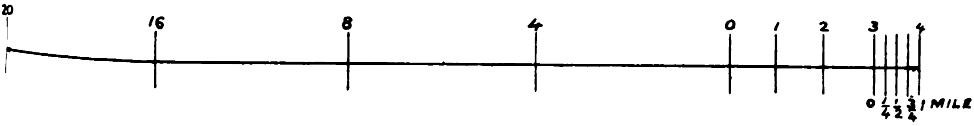
Table for plotting Map, and making Route Report from Diary in which distances are entered as time.

Time minutes. No. of yards, miles, or fractions of miles, and No. of yards + or – fractions of miles.

1	51	58	66	73	81	88	95	103	110	117
5	257 ¼ – 183	293 ¼—147	330 ¼—110	367 ¼—73	403 ¼—37	440 ¼	477 ¼ + 37	513 ¼ + 73	550 ¼ + 110	587 ¼ + 147
10	513 ¼ + 73	586 ¼ + 146	660 ½—220	733 ½—147	806 ½—74	880 ½	953 ½ + 73	1026 ½ + 146	1100 ¾—220	1173 ¾ – 147
15	770 ½ – 110	880 ½	990 ½ + 110	1100 ¾—220	1210 ¾—110	1320 ¾	1430 ¾ + 110	1540 1—220	1650 1—110	1760 1
20	1026 ½ + 146	1173 ¾—147	1320 ¾	1466 ¾ + 146	1613 1—147	1760 1	1906 1 + 146	2053 1¼—147	2200 1¼	2346 1¼ + 146
25	1283 ¾ + 37	1467 ¼ + 147	1650 1—110	1833 1 + 73	2017 1¼—183	2200 1¼	2383 1¼ + 183	2567 1½—73	2750 1½ + 110	2933 1¾ – 147
30	1540 ¾ + 220	1760 1	1980 1 + 220	2200 1¼	2420 1¼ + 220	2640 1½	2860 1½ + 220	3080 1¾	3300 1¾ + 220	3520 2
35	1797 1 + 37	2053 1¼—147	2310 1¼ + 110	2567 1½—73	2823 1½ + 183	3080 1¾	3337 2—183	3593 2 + 73	3850 2¼—110	4107 2¼ + 147
40	2052 1¼ – 148	2346 1¼ + 146	2640 1½	2932 1¾—148	3226 1¾ + 146	3520 2	3812 2¼—148	4106 2½—146	4400 2½	4693 2¾ + 147
45	2310 1¼ + 110	2640 1½	2970 1¾—110	3300 2—220	3630 2 + 110	3960 2¼	4290 2½—110	4620 2¾– 220	4950 2¾ + 110	5280 3
50	2567 1½ – 73	2934 1¾—146	3300 2– 220	3667 2 + 147	4034 2¼ + 74	4400 2½	4767 2¾—73	5134 3—146	5500 3¼—220	5867 3¼ + 147
55	2823 1½ + 183	3227 1¾ + 147	3630 2 + 110	4033 2¼ + 73	4437 2½ + 37	4840 2¾	5243 3—37	5647 3¼—73	6050 3½—110	6453 3¾—147
60	3080	3520	3960	4400	4840	5280	5720	6160	6600	7040
Miles per hour, rate of marching	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4



SCALE 1 INCH = 4 MILES



SCALE 1 INCH = 4 MILES

The scales are constructed by drawing a scale at 1 inch to 4 miles, or whatever other scale may be required, and dividing it up into divisions for time, 1 inch or 4 miles equalling one hour, other suitable sub-divisions being made.

A perpendicular line is drawn from it, and at a convenient distance above, a similar scale for ½ inch or two miles an hour is drawn parallel to the former scale. The two scales are then joined by diagonal lines, and other lines, at equal intervals apart, but parallel to the other scales, are drawn across the diagonals. In this way any number of scales may be produced from the first two, care being taken that the diagonal lines do not cut them at too acute an angle.

For example, the traveller finds from his diary that he went for 25 minutes at a rate of three and one-half miles an hour. He looks down the left side of the scale for the rate, and on the line opposite it measures off 25 minutes with his dividers from the right side of the scale, and plots it.

To use the Table.

The table is constructed by finding the number of yards travelled in an hour at any given rate; these are shown in the lowest column but one of the table; this is again divided by two for the distance travelled in thirty minutes and is found opposite the figures thirty in the left hand or minutes column of the table; the remainder of the table is constructed in the same way and whenever the figures do not divide out as a whole number which frequently occurs, the nearest number is given.

The figures in each column below the number of yards, show their equivalent as miles or fractions of miles, the minus or plus sign being placed against them with the number of yards by which they exceed or are short of the fraction.

As an instance. The traveller finds from his diary he went for 25 minutes at an estimated rate of three and one half miles an hour. He looks down the time column for 25 minntes, and along the bottom column for the rate 3½, where they cut he finds the answer 2567 yards or 1½ miles less 73 yards. He can enter the distance without any further trouble in his road report as 1½ miles, and if plotting on a small scale, can plot it as such from his scale, allowing for the 73 yards short, or if he is working on a larger one, he can plot the number of yards from his yards scale.

INFANTRY FIRE TACTICS.

By Lieut.-Colonel E. G. Barrow, Assistant Adjutant General,
Rawal Pindi District.

INTRODUCTION.

PREFACE.

The following Lectures were written and translated for the use of the HongKong Regiment. As, however, they may be useful to those who have to instruct the native ranks in other corps, the Council has decided to issue an URDU TRANSLATION at a cost of about FOUR ANNAS PER COPY, provided that a sufficient number of copies are ordered to cover the expense of publication. Applications for the same should be addressed to the Secretary, United Service Institution of India, Simla, not later than the 1st June 1896.

LECTURE I.

GENERAL PRINCIPLES.

"A defective employment of rapid loading weapons leads to an abuse of rifle fire, a waste of ammunition, and destroys discipline for fighting." This has been exemplified in many of our recent campaigns by the bad shooting of our men, notably in Afghanistan, in South Africa, and in the Soudan, and yet individually our men shoot better at the ranges than any troops in the world. This unfortunate result was due

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INTRODUCTION.

The Native Officers and Non-Commissioned Officers of the Indian Army being, as a rule, unacquainted with English, have few opportunities of learning and studying the principles which guide the tactics of Infantry under modern conditions, more especially as regards the proper employment of fire and the leading of companies and sections when under fire from the enemy. The Drill Book assumes an elementary knowledge of these subjects which the native ranks do not possess, while few British Officers are capable of imparting the requisite instruction on these matters in the vernacular.

I have always thought it a matter for regret that a short chapter on this subject has not been embodied in the Musketry Regulations for the Native Army, and accordingly I have prepared these lectures with a view to translation. They are almost exclusively based on the teaching contained in Mayne's "Fire Tactics" modified in certain directions by recent Continental experience, and with special reference to the Martini, that being the arm of the Native Infantry. I trust those for whom they have been prepared will carefully study them and endeavour to apply their teaching, for success in battle against a disciplined enemy will depend not only on the valour and steadiness of the troops and the ability of the Commander, but very largely on the tactical knowledge of the company and section leaders, for it is their leading on correct principles and the proper application by them of fire tactics that can alone ensure a thoroughly successful result. The most skilful operations of the ablest general must fail if the troops are badly led and their fire uselessly employed. In the modern battle between troops equally brave and equally well organized it is fire discipline and correct fire tactics that spell victory, and consequently it is as much the duty of company and section commanders to study these principles as it is for them to know their drill.

LECTURE I.

GENERAL PRINCIPLES.

"A defective employment of rapid loading weapons leads to an abuse of rifle fire, a waste of ammunition, and destroys discipline for *fighting.*" This has been exemplified in many of our recent campaigns by the bad shooting of our men, notably in Afghanistan, in South Africa, and in the Soudan, and yet individually our men shoot better at the ranges than any troops in the world. This unfortunate result was due entirely to the error of our system of training prior to those campaigns, a system which placed reliance on individual skill, rather than on the collective fire of masses, at suitable objectives.

Individual fire, except at the short ranges, is quite unreliable because—

(1) The exact range must be known.
(2) Defects in the firer, such as, bad eye-sight, excitement, fatigue, want of skill, etc.
(3) Defects in the rifle or ammunition.
(4) Adverse atmospheric effects, such as, wind or wet.
(5) The method of executing the fire and the position of the firer.
(6) The duration of fire.

In other words, at long ranges the very best shot may not hit the mark if he does not know the range, and even if he does he will not hit unless he is perfectly cool and his rifle and ammunition are in perfect order. Moreover, in action the accuracy of individual fire cannot always be ascertained and therefore errors cannot be rectified.

All theory and practice show that when distances are unknown it is useless for individuals to fire at ranges over 400 yards, and even when exactly known over 800 yards and then only at suitable objectives.*

A consideration of these facts leads to the conclusion that it is a waste of ammunition, even if the range be known, for bad shots to fire *individually* at ranges beyond those for which the fixed sight can be used, and for good shots beyond 800 yards. At greater distances collective fire should always be used.

The inaccuracy and unreliability of individual fire does not apply to collective fire because in the latter the "doctrine of chance" comes into play, and where a number of bullets are directed simultaneously at an object within reasonable distance a certain proportion will ordinarily take effect. The great fact to remember about collective fire is that to get a concentrated fire *the front of the object must be less than that of the body of men firing*, and as the effect diminishes with the distance the collective fire of a proportionately greater number of men is required to produce like results, that is to say, with the same objective the longer the distance the larger should be the unit firing. In other words, it may require a company volley to produce the same result at 800 yards that a section volley might attain at 500 yards.

Another point to consider in deciding the amount of collective fire to be employed is the nature of the objective, the height and depth of which are far more important that the breadth. Thus at long ranges experiments prove that column suffers twice as much as line and men standing four times as much as men lying down, while cavalry should theoretically suffer twice as much as infantry at all ranges. Thus it would require the fire of two companies to produce the same effect on a line lying down as a section firing at a column standing up.

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* This, of course, does not apply to out-post duty when fire is mainly used as a warning, or to the exceptional conditions of sieges.

The influence of ground on fire has also to be taken into consideration, as the relations of the trajectory to the slope of the ground affect the extent of the dangerous zone, and efficacious fire can commence at greater distance on ground parallel to the line of sight. Such ground is also more favourable to ricochets than would be fire directed across a valley. That is to say, when the ground is favourable the collective fire of smaller fractions may be employed than would be justifiable under adverse conditions of ground.

To obtain the best results from collective fire, careful "fire discipline" must be maintained to ensure concentrated fire At long ranges where distances are unknown two or more elevations may be used. For distances up to 800 yards (estimated) it will be sufficient to use two sights, respectively 50 yards over and under the estimated distance. For greater distances three sights may be used, one for the estimated distance and the other two respectively 100 yards over and under, *e.g.*, with a company firing at 1,000 yards (estimated) the right section Commander should order his sight to be put up to 1,100 yards the left section would adjust to 900 yards and the two centre sections to the named distance, viz., 1,000 yards. With a section firing at 600 yards the right squad* would adjust to 650 the left to 550. With a company firing at 750 yards, the right half-company to 800, and the left half to 700 yards. In all cases when using different sights the different elevations should be allotted to separate units, such as, half companies or sections rather than to the different ranks, so as to permit of better supervision by the unit Commanders. It is doubtful whether two sights should ever be used by a unit smaller than a half company and, as a rule, long range fire would never be used by a unit or fraction smaller than a half company and then only at good objectives.

With regard to long range fire although the fire, of small units except under very special circumstances is useless, yet the experience of two campaigns—the Franco-German and the Russo-Turkish—shows that even unaimed fire is capable of giving great results (witness St. Privat and Plevna) what then may not be expected from judiciously employed controlled fire, but in using it the cardinal point to remember is that *the greater the distance the greater must be the number of rifles employed and the larger or denser the objective.* For example, 200 rifles may usefully fire at a battery 1,500 yards distant while it would be folly for a section to do the same.

Long range fire should never be used by troops intended for the attack or by troops in movement, as steady fire cannot be combined with movement and attacking troops cannot afford the waste of ammunition entailed by long range fire. It is on the defensive when ranges are measured and known that it will chiefly be employed, and on the offensive it will only be used by troops specially told off for the purpose. Though thus limited it its applicability, it must not be forgotten that one of the advantages of a long range weapon is the employment of long range fire in the preparatory stage of an engagement, and not to employ it in suitable circumstances is to sacrifice that advantage.

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* I use the word "squad" instead of "sub-section" throughout, as the latter in the vernacular may easily lead to confusion, *sub*-section in Hindustani meaning *the whole* section.

The drill book divides distances into three zones: long, medium, and short or decisive. The *short zone* (under 500 yards) is essentially that of independent fire or of the collective fire of squads. The *medium zone* (800 to 500 yards) is that in which men though extended should fire collectively by sections, half companies, or companies, according to circumstances *the greater the distance or the worse the objective, the greater being the fire unit employed.* The *long zone* (1,500 to 800 yards) is that in which collective fire should be limited to employment by large bodies, such as battalions or companies at considerable objects. Although the short zone is here spoken of as the zone of independent fire it is only so because, as a rule, collective fire cannot be maintained within 400 yards, for men exposed to heavy fire at short ranges naturally get out of control, but nevertheless collective fire by squads should be maintained even in this zone as long as possible, for rapid un-aimed fire is only really useful when a thick line of the enemy is very near, *i. e.*, within 200 yards. It is impossible to check independent fire once it begins, and it should only be allowed when controlled fire is no longer possible. *It should never be forgotten that mutual or collective action always has been and always will be the secret of victory.*

LECTURE II.

FIRE DISCIPLINE AND FIRE UNITS.

Fire discipline means the habit developed in the men by training, of firing only in the manner directed by the Commander. The soldier must be thoroughly impressed by the efficacy of collective fire as compared with independent fire, and by strict discipline only can the full result of this knowledge be obtained In the modern battle *fire discipline is everything.* Individual fire is of no account beyond 400 or 500 yards. The only really effective fire is that which proceeds simultaneously from a great many rifles directed on the same spot. Above 500 yards the errors in judging distance exceed the dangerous zones, so that the employment of picked shots individually is fallacious. Although individual skill is to be encouraged the independent action of men at long or medium ranges cannot be too strongly deprecated for the first principle is to concentrate the fire of as many rifles as possible on the important points in the shortest time, and this can only be done by controlling the fire. To keep the men in hand ought therefore to be the constant pre-occupation of officers at peace exercises. The points to be considered are the following:—

1. *The distance at which fire should open.*—Naturally troops advancing to attack should approach as near to the enemy as possible before commencing fire. When within effective range the firing line should be re-inforced so as to ensure as heavy a fire as possible. An early opening of fire is to be deprecated except in the case of false at-

tacks or delaying actions when it is intended to deceive the enemy. A premature fire only prolongs the fight and weakens the energy of the attack. As a rule, on the offensive the firing line should never open fire over 800 yards unless the objective is particularly vulnerable, such as a mass of cavalry.

2. *Determination of the force required.*—The first condition of success is to gain a superiority of fire, so that directly effective range is reached the supports should re-enforce. The greater the number of rifles employed the better. The moral effect is also greater the more fire is concentrated in time as well as space, *i.e*, 100 men firing 5 rounds in 1′ will produce a greater impression than 25 men firing 20 rounds in 4′. Moreover, to restrict fire by extending first a weak line and gradually re-enforcing it is to be greatly inferior to the enemy in the matter of fire. The Firing Line should be strong from the beginning. Generally speaking in European warfare a greater extension than one man per yard is to be avoided.

3. *Selection of fire objectives.*—Too frequent changes of objective lead to a scattering of fire. Objectives should be chosen from a tactical point of view and with regard to their dimensions. Having selected the objective, fire on it should be maintained till it is destroyed or paralyzed, unless some strong reason presents itself for changing the objective. If the enemy is attacking, as a rule his nearest *échelon i e.*, his firing line should be the objective If that firing line is halted under cover and offers a bad target, fire may be directed on the supports or reserve, although, as a rule, fire will always be direct to the front ; at the same time the moral and material effect of a cross or flanking fire should never be forgotten.

4. *Determination of range and choice of sights.*—As the efficacy of fire depends more on the range being known than on individual skill, every opportunity should be taken to measure ranges. The artillery should always be referred to when possible, and failing other means trial volleys should be fired. When obtained the combined use of two or three elevations will be found to give better results at long ranges than one elevation.

5. *The kind of fire to be used.*—Volley firing should be the rule and should be employed as long as possible for not only does it give the power of direction but its moral effect is certainly greater than that of any other description of fire. Volley firing should always be used in repelling night attacks, and also in repelling cavalry. But volley firing can seldom be maintained under 500 yards, and certainly if the small fire units, such as sections and squads have become intermixed it never can be maintained. *Mass firing* should then be resorted to if possible. By *mass* firing is meant controlled individual fire as opposed to uncontrolled independent fire. That is to say, when noise or confusion render volleys impossible it may still be feasible to get certain groups or collected masses of men to fire a certain number of rounds, or for a certain limited period only at certain specified objectives ; for example, a re-enforced line of skirmishers at 600 yards may be in too great confusion to fire volleys, but it may be still sufficiently under

control to obey the whistle and to fire only in the direction ordered. Whenever volley firing is employed the number of rounds used should not exceed four in each [illegible] movement [illegible] control, or if dependence is placed in the whistle the time allowed should not exceed three or four minutes. But as mass firing will nearly always degenerate into independent fire it should only be resorted to when volley firing is impossible. When volley firing is employed it should not be executed by more than a company, or at a greater rate than 5 rounds a minute, nor should the number of successive volleys exceed 4 without a long pause to restore calmness and to let the smoke clear.

6. *On the intensity of fire.*—On good objectives, such as a battery, the rate of fire should be quick. On a bad target it may be slow. Five or six rounds a minute is quite quick enough as a rule, even when the target is good. Too rapid a fire unsteadies men.

7. *On the position of the men.*—The lying down position is always the best if it can be used; but when advancing, troops should cease to use it within 600 yards or there may be difficulty in getting the men to rise.

8. *When men in movement may fire.*—Distant fire and frequent halts are not good for troops on the move, as they destroy the energy of the advance; but occasional volleys may be fired to give the men a safety valve for their emotions. Between 800 yards and 400 yards there would usually be about 8 successive rushes and pauses. These pauses should not last more than a minute during which about 3 rounds may be fired.

9. *Fire Units or Groups.*—To get the greatest number of rifles into play the men must be in line, and the largest effective line that can be controlled by voice or whistle is about 50 paces. If the men are in two ranks the fire unit should therefore be the company. If in one rank and there are more than 50 rifles in the company the fire unit should be *the half company*. The fewer the units the easier is the control, and the greater the knowledge and experience of the leaders, that is to say, the longer the control remains in the hands of officers, the better. As the enemy is approached the difficulties of control are increased and the objectives have become more clearly indicated so that the fire units may now be sections; as we get still nearer the enemy and come under a close fire it becomes impossible for a single man to look after more than about a dozen others, so that the sub-section or squad then becomes the unit. The several units should as long as possible be like the guns of a battery subject to the control of a superior commander. As long as possible that superior commander will be the Battalion Commander or the British officers in the firing line, but as the attack moves on the command will gradually devolve on the Native officers. It is then for them to determine the objects to be fired at, and the nature of the fire as well as to give the range, to watch the effect of the fire and to select the ground for each halt. The Section Commanders must see that these orders are carried out and themselves give the necessary executive commands.

Company Officers, and indeed all who are in any degree responsible for the training of the soldier for battle, must remember that *the science of Infantry Tactics consists in suitably concentrating fire with a view to demoralizing the enemy at the point of attack and so rendering an assault possible.* That is to say, victory can only be ensured by efficacious fire, and this can only be obtained by strict discipline and constant practice till what we call "fire discipline" has become so thoroughly instilled, that adjusting sights and firing only as directed will be as much a matter of habit to the soldier as forming fours or sloping arms by word of command.

To still further ensure this, the control requisite for the maintenance of fire discipline must be carried down to the sub-section or squad as that is the largest unit that can be controlled by one man at decisive ranges. When this degree of training has been reached our troops will be fit to meet any enemy in the world.

LECTURE III.

TACTICAL DEDUCTIONS.

A consideration of the foregoing principles of fire tactics and the elements of fire discipline enables us to arrive at a fairly correct idea of the features of a modern battle and the principles which should guide a commander in making his dispositions for an attack. This, of course, is not the business of a Native officer, still to enable him to intelligently carry out what is his business it is essential that he should understand the principles on which the arrangements for the attack are made, just as every captain and subaltern should study strategy, though in the natural order of things he will probably nevrr command any greater unit than a battalion.

The usual course of a battle when an army is acting on the offensive is somewhat as follows. The cavalry covering the advance comes in contact with the enemy and the advance guard takes up a forward position to cover the deployment of the army more especially of the artillery which is the first arm to become seriously engaged. The artillery takes up a position or positions at least 3,000 yards away from the enemy and opens fire, its first object being to overpower the artillery of the defence. When that is done it turns its attention to the actual positions which it is intended to assault. Meanwhile the Infantry has come up and has been deployed in accordance with the General's disposition for attack. But the whole of this infantry will not be employed in the actual assault; not only will a portion be kept in reserve to meet unexpected eventualities, or to confirm success by an active pursuit, but a certain proportion* will doubtless be utilized in assisting the artillery by long range fire to crush the defence at the intended points of assault. That is to say, after the preparatory fire of the artillery has had its due effect, or even during that stage if possible, the troops intended for this purpose will be pushed forward to a position from 1,000 to 1,500 yards of the enemy with a view to assist in the demoralization of the defence by long range fire. The troops detailed for this duty would usually be deployed in line by battalions or half battalions according to the nature of the ground and the general dispositions for attack, while all firing would at these long ranges be by volleys from entire companies. These troops will require a large supply of ammunition, which, however, can in such situations be easily brought up from the rear.

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* This proportion might be from $\frac{1}{3}$ to $\frac{1}{5}$ of the whole. Thus in the case of a division (14 battalions) attacking alone 3 or 4 battalions would probably be thus employed.

When the enemy's fire has been more or less overcome and resistance at the intended points of attack begins to slacken, the moment for assuming the offensive will have arrived, and the troops intended for the attack will be put in motion. These troops are those described in the drill book as the First and Second lines.

The great difficulty, the vital problem, for the offensive is how these lines are to be brought forward to the attack, and it is this problem, one which has never yet been put to the test of experience or solved by the rude teaching of actual warfare, that must be faced. We can only in this matter be guided by theory, and our troops, in the absence of more practical teaching, must be trained to act in accordance with the theories that have been adopted in the drill book.

The rules which should guide the conduct of the attack are—

(1) To get within decisive range, *i.e.*, to within 500 or 400 yards.

(2) When there, to move as little as possible till the assault takes place.

(3) To concentrate fire on the points of assault.

These are all duties that would fall on the First line, more especially on the firing lines and supports. To enable these rules to be observed it is essential that units should be preserved as long as possible with a view to maintaining control. From the moment it comes under fire, the firing line must move in single rank for close formations even at long ranges are inadvisable against disciplined troops, but this line should never be a weak skirmishing line. From the very first it should be *as thick a line as is compatible with free movement.* The stronger the line the heavier will be its fire, the greater will be the confidence with which it advances, and the greater its moral effect on the enemy. An extension to 1 yard or at the most 2 paces will, as a rule, meet the case. This firing line will usually have to be extended as soon as it enters the long zone, for it will then become exposed to long range fire. As already explained (page 8) the fire unit should not cover more than about 50 yards of front, so that at this stage the half company will become the fire unit, and as a rule four such units will be extended in the firing line of each battalion. This firing line will move steadily on, as long as possible in one line, without firing. As the medium zone is approached, this steady simultaneous advance will no longer be practicable, and the advance will have to be made by a series of rushes, for the firing line will then be coming under fire more or less heavy. The attack can then only be carried on by the successive advance of alternate portions or échelons of the line, the stationary portion covering the advance of the moving portion by fire. As the attack must move on in a direct line, it cannot diverge for the sake of cover, but must rely on rapidity of movement across the fire swept zone—just as when it is raining the man who runs across a street will get less wet than one who saunters across. Accordingly all movements should, if the ground permits, be executed at the double, but as troops cannot double great distances without fatigue, and as the moral effect of firing should not be abandoned, the only true method of advancing, during this period of the attack would seem to be by alternate échelons doubling 50 yards or so and opening fire. This advance would also be covered by the longer range fire of the troops specially detailed for that purpose (vide page 9), that is to say, the long range power of the rifle should be utilized to cover the advance, even to the extent, if necessary, of firing over the heads of the attacking troops. If we do not utilize this power we sacrifice one of the main advantages of the weapon. In this advance by rushes it is essential that the fractions or échelons should be few in number and should each have *at least* the front of ¼ of the battalion but better still, of half. The advance by *alternate* units when there are more than two is bad, because it impedes the fire of the units in rear and also because it is apt to cause divergence of direction owing to the difficulty of maintaining the proper intervals. The advance by successive units from a flank is bad, when there are more than 2 or 3 such units because it tends to make the attack dilatory and deficient in energy.

For these reasons, though the fire unit may at this period be even a section and there may be eight or more sections in the firing line, yet the unit or echelon of movement should be *at least* the half company or, better still, one half the whole firing line. It is obvious that if eight sections were to advance by alternate sections, the fire of those in rear would be much impeded, if not altogether arrested by the sections in advance, while if the advance was made by sections from a flank it would take four times as long as one made in two echelons. That is though after the firing line enters the medium zone fire will be by sections, the impulse for each advance must be given by the British officers in the firing line, and this is exactly as it should be.

The object of the firing line is by means of these successive rushes to reach a position as near to the enemy as possible, usually between 500 and 300 yards, from which a rapid heavy fire can be brought to bear. By the time it reaches such a position the firing line will have suffered heavy losses, hence the necessity of supports and reserves to fill the gaps thus caused, and to keep the firing line as strong as possible (*Vide* p. 114 Infantry Drill). As losses occur, the men should close in by sections or squads so that the fire units may be kept distinct, and into these gaps fresh sections or squads from the supports will be inserted. The probability is that by the time the firing line has reached the short or decisive zone (*i.e.*, 500 yards) the whole of the supports will have been absorbed, and the moment will have come for bringing up the reserve so that the intensity of fire may be maintained. As regards the supports, in ordinary cases they will be required to send forward squads or sections to reinforce shortly after entering the medium zone, if not earlier, and as it seems doubtful whether large units like companies can be got to close in under fire without a break, these reinforcing units will be inserted in the firing line wherever gaps occur, and as they should, if possible, belong to the same tactical units as the men in the firing line whom they reinforce, it has been found expedient to distribute the battalion so that the companies in the firing line should find their own supports. On the other hand the reserve will, as a rule, only be brought into the firing line after the medium zone has been passed, and when the firing line can no longer advance. At this period the fire will probably be so heavy that all closing to make room for fresh units will be impossible, and therefore the reinforcement by the reserve will, as a rule, have to be direct and not to a flank or to fill particular gaps, consequently to maintain control and prevent too great intermixture it will usually be found best to bring up the reserve by companies in single rank. If these companies when brought up can communicate a fresh impulse to the advance an endeavour should be made to push on nearer the enemy, by rushes, otherwise all that can be done is to join in pouring a hail of fire on the enemy. If the men can still be kept under control, volley firing or mass firing should be maintained, but the chances are that control will have been lost and the firing become independent.

We now come to the part to be played by the Second Line. As it is the duty of the First Line to prepare the attack, so it is essentially that of the Second Line to make the assault, and as the assaulting force has to get at the enemy as rapidly as possible, it is clear that efficacy of fire cannot be expected from it. In all attacks therefore, a distinction must be made between the duties of preparation and execution, and distinct forces told off for each duty. The battalions told off for the assault will usually find it best to advance in "column of half battalions in line" in single rank, but on this point the drill book is silent as circumstances must guide every case. All that can be prescribed is that the Second Line must be gradually brought up near enough to be utilized for the assault when the psychological moment arrives, and then that it must be hurled forward wave upon wave without pause and regardless of loss till the position is stormed and won.

A battle with a civilized foe may be compared to the operations of a siege. The artillery position 3,000 or 3,500 yards away from the enemy represents the first parallel. The preparatory position of the infantry at long range may described as the second parallel, while the decisive firing position between 500 and 300 yards is the third parallel, whence the assault will be launched against the breaches in the enemy's line of battle which have already been made by the fire directed from the parallels.

Such, as far as we can tell, will be the conditions of the modern battle. Company and Section Commanders must endeavour to realize those conditions, and the part they will be called on to play. If they do not do so and if they remain helplessly dependent on others for orders at critical moments, all the skill and experience of the General will be of no avail and the battle will be lost. Every native officer holds a position of honour and trust. If he does not try to the utmost of his ability to study what he may be called on to do in war, he is unworthy of his honourable position. It is in the hope of in some degree aiding in this duty that I have prepared these lectures.

RULES AND AXIOMS FOR GUIDANCE.

(1) Never allow the individual fire of bad shots at ranges over 400 yards or that of good shots over 800 yards.
(2) Volley firing must be maintained as long as possible.
(3) The height and depth of an object are more important than the breadth.
(4) The front of an object should be less than that of the unit firing.
(5) The frequent change of objectives is objectionable. Those selected should be fired on till destroyed.
(6) Every opportunity must be taken of ascertaining ranges.
(7) The "lying down" position is the best, but as a rule it should not be used within 600 yards by troops advancing to the attack.
(8) At long ranges when distances are unknown 2 or more sights should be used. Over 600 yards 2 sights, over 800 three sights.
(9) The longer the distance the larger should be the fire unit.
(10) Long range fire should, as a rule, never be used by a unit smaller than a half company.
(11) Long range fire should never be used by troops told off for the attack.
(12) Long range fire should be used chiefly by troops on the defensive at known distances, or by troops specially detailed to fire from the preparatory position.
(13) On good objectives the fire should be rapid, on bad targets it should be slow.
(14) The *short* zone is that of independent fire or the collective fire of squads. The *medium* zone that of the collective fire of sections, half companies, and companies. The *long* zone that of companies or larger units.
(15) Fire units should not cover more than about 50 yards of front.
(16) As a rule the Firing Line should not open fire over 800 yards.
(17) The Firing Line should be strong from the commencement.
(18) Distant fire and frequent halts by troops on the offensive are bad.
(19) The fewer the units the easier the control. As long as troops are in two ranks the unit should usually be the Company. In single rank the Section should be maintained as the unit as long as possible, and only in the short zone should the squad become the fire unit.

THE GERMAN, FRENCH, AND RUSSIAN SYSTEMS OF INFANTRY ATTACK AND DEFENCE.

A COMPARISON OF THE EXISTING REGULATIONS.

Translated from the *Deutsche Heeres Zeitung*, by Captain P. HOLLAND,
5th Punjab Infantry.

Communicated by the A. Q. M. General Intelligence Branch.

All the regulations for the field training of the German, Russian, and French Infantry are based on the experiences of the Franco-German and Russo-Turkish campaigns, and although permeated in the main by the same essential principle, the various individual problems of the fight are solved in different ways.

At the conclusion of the Turkish war, the Russians did their utmost to improve the existing "Army Regulations" which were frankly acknowledged to be faulty. The movement resulted in the issue of the Infantry Regulations of 1881. These were gradually altered and enlarged up to the time of the last issue in June 1893.

In the year 1884, after several provisional issues had appeared in 1875 and 1883, the new French drill book appeared in five parts (4 books) and except for a few modification made in 1894, this is still the standard official book. This was followed in 1888 by the German drill book, which, with the exception of a few changes introduced in the 1889 edition, is still the regulation book.

In all three cases the smallest infantry unit is the company, with a strength varying between 200 and 250 rifles. Similarly, in all three cases, the double rank formation is adopted.

In the German army the distance between ranks is 64 c. m. (about 25⅛ inches), in the French army 50 c. m. (about 20 inches), but in the Russian army the distance of the rear rank man is a full arm's length from the edge of the knapsack of the front rank man.

In the French formation, on the other hand, the smallest distance between files is about 15 c. m. (nearly 6 inches), in the Russian formation somewhat closer 10 c. m. (nearly 4 inches), and in the German army shoulder to shoulder.

In the Russian and German armies, the supernumerary rank is 2 paces from the rear rank, and in the French army 4 paces.

The German company is divided into 3 sections[†] commanded each by a Lieutenant, these are again divided into half-sections (half-zug), of at least 8 files and sub-sections or groups (German "Sektionen.") of from 4 to 6 files. The Russian company is divided into two half companies of two sections each (Zug). These sections are composed of 16 or more files, and are divided into 4 sub-sections (Sektionen) or when under strength into

[†] The word used is "Zug" which is very broadly employed in German. It might be more advisable to use the word "division" here as the word "Sektion" follows shortly afterwards.

2 sub sections. The number of files in the latter varies between 4 and 8. The uneven sections (Zug) are commanded by the two senior Lieutenants who are also company commanders, and the even numbers by the next senior officers.

The French company, similarly to the Russian, consists of 2 half companies called "pelotons."[*] These are again composed of 2 sections (Fr. sections) the section containing 2 "demi-sections" or half sections; the half division has 2 "escouades," or groups, and the "escouade" consists of from 4 to 6 files as in the German army. The 4 sections are commanded according to their numbers by the senior Lieutenant, the Reserve Officer, the Adjutant, (a non-commissioned officer)[†] and the "sous Lieutenant" or sub-Lieutenant. The half-sections are commanded by Sergeants, the wings of the half-section having Corporals in the front rank. In each group there are 2 specially trained men employed as "Eclaireurs," or scouts for reconnaissance purposes, this fact being noted in their discharge certificates with a view to their later employment. The soldiers of the 1st class correspond to the German[‡] "gefreiten."

The German "company column," with a depth between sections (Zug) of 7 paces, corresponds to the Russian "double-section column" in two echelons ("Staffeln,") and the "section column" in 4 echelons (Staffeln) with a distance of 5 paces.

The French "colonne de compagnie" corresponds to the above, the distance between sections being 6 paces.

All marching formations in the Russian army are similar to those in the German, but the former have also a "double rank column" which is formed by the even or uneven numbers coming up, giving a total breadth of 4 men. The French have something very similar to this in their "formation par le flanc," in 4, 6, and 8 ranks. The German "section-column" (sektions-kolonier) is however unknown.

In the German army, the length of pace is 80 c. m. (about 31½ inches) that of the French 75 c. m. (about 29½ inches) and that of the Russians only 71 c. m. (about 28 inches.)

The German rate of marching is 114, the Russian 116-120, the French 128 paces to the minute, giving a rate of 91 metres (100 yards) 82-85 metres (90 yards) and 96 metres (104 yards) respectively. At the double we find matters reversed, the Russian covering 181-192 metres (195-208 yards) the Germans 165-170 metres (175-184 yards) and the French 136-144 metres (148-156 yards) per minute.

The Battalion in all 3 armies is composed of 4 companies under one command.

A Regiment both in the Russian and German army consists of 4 battalions, in the French only 3 battalions.

A "normal" brigade is in all 3 armies composed of 2 regiments.

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[*] The origin of our word "Pultan."

[†] German, "Unter-offiziers—charge"—*lit* rank of under officer.

[‡] Lance Corporals or men exempt from guard mounting.

The main ideas of an attack formation are practically analogous in the three armies, the principles being roughly as follows:—

(*a*.) Whenever possible a flank as well as a frontal attack should be carried out.

(*b*.) Development of a sufficiently strong firing line at the right moment.

(*c*.) All available fire to concentrated on the defenders at effective distances, every advantage being taken of the ground over which the advance is made.

(*d*.) As soon as firing has commenced, the line to be re-inforced as required, the advance being carried out gradually, and every effort made to gain preponderance of fire.

(*e*.) Reserve to be kept as far as possible out of range of the enemy's fire from the commencement, but to be gradually and steadily advanced, until they are eventually brought up rapidly into the firing line, when the whole will advance to the assault.

(*f*.) This must be followed up by fire brought to bear upon the retreating enemy, the reconcentration of troops, the pursuit being then carried out either by patrols or whole corps as may be directed.

The actual system of attack differs in some details in the various armies.

No "normal attack" is recognized by the Germans, the outline merely being given, and the rest being left to the discretion of commanders, the guiding principle being that a well delivered and determined attack ensures success.

The following are the most characteristic points in the German attack.

i. Unless ordered to the contrary, skirmishers extend at a distance of 1-2 paces between files. The frontage occupied by a company in the fighting line will, however, not exceed 100 metres (108 yards) as the extension of entire companies is generally delayed until the last stages of the attack.

ii. At the commencement of the attack not more than ¼ of the whole will as a rule be extended and not less than ¼ for the reserve. This is, however, not a hard and fast rule.

iii. The distance of units in rear of the fighting line varies according to requirements from 200 metres (219 yards) upwards.

iv. Skirmishers are only to double over open ground and when the enemy's fire renders it necessary.

v. On reaching the zone of effective fire, troops in close formation form single rank, but there is no rule laid down as regards the interval between files,

vi. On the signal "alert" denoting the approach of cavalry, the square formation is only adopted when the infantry have been demoralized, and ammunition is running out, or when retiring over open country, they are constantly being harassed by large bodies of cavalry.

vii. There are two kinds of fire employed according to the regulations viz:—"volleys" and "independent."* The former are employed usually at the commencement of the attack when the firing line is not within effective range of the enemy's fire. Volleys are therefore the exception, and not the rule.

viii. At the closer ranges and up to 600 metres (650 yards) everything is aimed at, at the medium ranges, and up to 1000 metres (1080 yards) at high and wide objects, and only exceptionally at the long ranges over 1000 metres (1080 yards) at large and deep formations. From 800 metres (866 yards) upwards when the range cannot be approximately fixed, 2 sight vanes 100 metres (10 yards) apart are used.

ix. Rapid firing is as a rule only employed when within 350 metres (380 yards) of the position, but in exceptional cases it may be used effectively up to 1000 metres (1080 yards).

x. Firing "on the move" seldom has any effect, and is therefore scarcely ever employed, except when perhaps a skirmishing line is retiring and is hard pressed by the enemy Similarly long range indirect fire is seldom employed Such are the complete details of the attack as laid down, innovations being strictly prohibited by the regulations.

The Russian regulations on the contrary prescribe for every detail of the development of the attack, and of the assumption of the "offensive" for a company, battalion, regiment and brigade. The normal Russian attack is carried out on the following lines:—

(*a.*) The advance is commenced before entering the zone of the enemy's artillery fire, even at a distance of some 4 versts (4600 yards) all details having been previously arranged as regards extension of skirmishers, reserve &c.

(*b.*) The advance on the enemy's position (which is assumed as a rule to be intrenched) is thus cautiously carried on from here to about two versts (2300 yards). Here a halt is made still out of range of the enemy's fire, when the battalions (as a rule 2) intended for the fighting line are formed into companies "in close formation." The latter are then formed into double sectional, or sectional columns at an interval of 120 paces and a depth of 150 paces.

(*c.*) This formation having been completed, 3 patrols (of 3-4 men each) are usually pushed out from the 4 most advanced companies, to the front and flanks to a distance of 3-500 paces.

(*d.*) Under cover of these patrols the advance is resumed up to about 2000 paces (1500 yards) from the enemy's position, the advance guard "falling back and resuming their place in their own companies."

(*e.*) At this point the four companies of the "first line" extend a chain of skirmishers, usually two sections, the advance patrols closing in on them on the march. The advance is then made along the whole front at a steady pace (each company having a frontage of 250 paces) up to the zone of effective infantry fire, (for about 800 paces).

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* The Geman Schutzenfencer—*lit.* skirmishers or marksmen's fire.

(*f.*) The "Company Reserve*" (2 sections each) follow as a distance varying according to the nature of the ground, in open country at 500 paces.

(*g.*) The "Battalion Reserve" (2 companies each) with the full interval (from centre to centre 250 paces) follows the "company reserve" at the same distance, forming together with the latter and the firing line the "*1st line.*" The "*2nd line*" consists of the 3rd and 4th battalions of the regiment, and follows at the same distance.

(*h.*) Finally, the last unit consisting of the whole of the 2nd regiment with its battalions massed, acts as the "Brigade Reserve." Its position is left entirely to the discretion of the Brigadier.

(*i.*) When closer contact with the enemy has been attained, at about 800 paces, the skirmishers advance by rushes to about 150-300 paces from the enemy's position, being reinforced as required.

(*k.*) At this point the greatest possible amount of fire is concentrated on the position, and then either the skirmishers (alone, or in combination with the company reserves which have been meanwhile brought close up) advance to the assault. The attack may be eventually pushed home by re-inforcements from the "battalion reserves."

The fighting line, (*lit.* line immediately in front of the "company reserves") keep up a continuous fire, during the advance to the assault. When about 50 paces from the enemy's position they advance at the double, the whole line throwing itself upon the enemy, shouting "Ura!" (Hoorah!)

(*l.*) In the event of the assault being successful, the pursuit is commenced at once, but if repulsed, the retirement is covered by the reserve.

The following are the particular points characterizing the Russian attack formation:—

i. The interval between skirmishers in the front line is 2 paces.

ii. Companies of 200 rifles formed for attack are expected to occupy a frontage 250 paces. It must therefore be very difficult for the company commander to control this long line and to maintain the requisite concentration of fire on the occurrence of casualties.

iii. The extension of entire companies into skirmishing lines, is as with the Germans, delayed as long as possible.

iv. In detailing units for the attack, it is laid down that the general reserve should consist usually of not more than one-half of the available force. In the German regulations, on the other hand, it is laid down that with a brigade of 2 regiments the Brigadier must have at his disposal a reserve of at least one battalion or $\frac{1}{6}$ of the whole.

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* Corresponding to our "Supports."

v. Under normal conditions and in open ground, the reserve and other troops in rear follow at a distance of 500 paces, shewing very decided principles as regards the depth of formation. This distance is decreased as the advance progresses, it being imperative to have both "company" and "battalion reserve" closer up as the enemy's position is approached by the firing line.

vi. From 800 paces onwards, the firing line and reserves always advance by rushes of 100 paces, the reserves being preferably in single rank with one pace between files. They are however, closed again during the assault, just before the final rush. If times permits, intrenching tools are used, the Russian infantry being equipped with the spade as in the German army.

vii. On the signal "The whole" *(das Ganze)* being given, denoting the presence of the enemy's cavalry in the neighbourhood, no particular formation is prescribed, volleys being chiefly employed to repulse an attack.

viii. In the Russian attack, volleys are principally employed, close formations firing nothing else. Up to 600 paces small objects are fired at, up to 800 paces aim is taken at cavalry,* and at ranges beyond 800 paces only at large formations. Nothing is laid down as regards firing without word of command.

ix. The new Russian "3 line" rifle, Model 91 (7,626 millimetres calibre), has a so-called "fixed sight,"* with which all aim is taken up to 800 paces. 400 paces is the "point blank"† range, the sight here used being something between the German block-sight (or "fixed sight")* and the small leaf. From 4 to 800 paces aim has to be taken above the objects, which is a distinct drawback. At longer ranges, the sight is adjusted to requirements, aim being invariably taken at the bottom of the object. Simultaneous firing with 2 or more sights is not practised by the Russian infantry. Rapid firing "on the move" is employed during the last stage of the attack, *i. e.* from the last advance to the assault, and also when retiring after an unsuccessful assault. This corresponds to the German "Schutzen in die intervalle" system which has been eliminated from the new regulations, it being extremely doubtful whether such firing is of any value at all. "Indirect" or "unaimed" fire is employed both in "volley" and independent firing at ranges beyond 1000 paces, and on objects under cover. It is, however, acknowledged to be of very little value.

Up to the year 1894, the French had a "Normal attack" similar to that of the Russians, and in the latter portions of the regulations, there were five "plans" giving the system of attack for a regiment, brigade and divisions. Although these re-appeared in the new issue of 1895, a note dated 15th April 1894 had entirely cancelled them.

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* The German expression used here is "Cavallerieziele unter feuer genomenew."

* German "Standvisir."

† German "Kernschuss."

The system is precisely similar to the Germans:—

"Seule l' offensive permet d' obtenir des resulats decisifs."

For the actual carrying out of the attack, there are no "instructions" but merely "indications" or "general lines" subject to variations at the discretion of the commander, according to circumstances. There are, however, distinct regulations as regards the duties of individual units on the parade-ground, so that a new system has to a certain extent replaced that which was cancelled.

The attack of an independent regiment, for example, is thus detailed:—

1. The regiment forms in 3 lines (lignes) of one battalion each.
2. The 1st line only carries out the frontal attack, the 2nd line secures the flanks, supports the 1st line, pushes on the attack should the 1st line be weakened, and renews the attack in the event of the 1st line wavering.

   The 3rd line (ligne de manœuvre) carries out flank attacks under the immediate orders of the commander, and also meets and resists any flank attack attempted by the enemy. It also supports the attack, participates in the pursuit or covers the retreat, and secures the latter by throwing up hasty intrenchments. The latter would appear to be a measure somewhat difficult of accomplishment, during the confusion of the fight!
3. The extent of front covered by a regiment acting independently does not usually exceed 700 metres (about 760 yards).
4. The distance between the lines varies between 3 and 600 metres (325 and 650 yards).
5. Should there be no fixed point of direction, or should such be temporarily lost to view, compasses are employed. Besides officers, under-officers* and even a few corporals should invariably be trained in the use of a compass.
6. When carrying out a frontal attack in open country, the following are the details required from the battalion of the "1st line."

(*a*.) The commander gives all his orders, if possible in the presence of all the officers. He sends out as many* "eclaireurs" as he thinks necessary under an officer. Since the introduction of smokeless powder the task of the latter will be no easy one. He will have to reconnoitre the ground and the enemy, drive back the enemy's patrols, and by a discreet employment of fire enable the companies of the "fighting line" to come up into position. These parties should conceal themselves about 1000 yards from the enemy, sending back constantly any news of importance to the battalion commander, as regards the enemy or country.

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* "Sous-officiers."

* Scouts.

The Germans have to a certain extent adopted this method, and Freiheer von der Goltz is a warm supporter of it. No attempt has, however, been made to follow up the idea, and very rightly so.

(*b.*) As soon as the "eclaireurs" are 500 metres (540 yards) in advance of the battalion (during which time all mounted officers will have dismounted) the companies of the "front line" (as a rule 2) with an interval of about 30 metres (40 yards) the companies of the "Réserve de Bataillion" following at a distance of 400.500 metres (about 425-550 yards).

(*c.*) At about 1300 metres (1400 yards) from the enemy's position, the front companies extend either by files at one pace or more, or merely form single rank. Direction and dressing are by the centre, the distance between sections* being a few paces.

(*d.*) Having reached the "èclaireurs," the companies form the firing line in single rank, and the "èclaireurs" having closed in they advance until firing commences. The reserve companies now diminish their distance to 300 metres (325 yards) covering the flank of the front companies.

(*e.*) The "ligne de combat" fire as a rule "section," and sometimes "peloton" volleys, the advance being made by companies alternately until about 500 metres (540 yards) from the enemy.

(*f.*) At this point the firing line must receive considerable reinforcements. Both the companies hitherto in rear, therefore join the firing line, and carry it forward to about 400 metres (430 yards) from the enemy, the battalion of the 2nd line now acting as a reserve to the 1st.

(*g.*) The 1st line now fixes bayonets, rapid fire is commenced, and the advance is made by alternate rushes with rapid firing for about 150-200 metres (160-200 yards).

(*h.*) Officers now give the word of command for "magazine fire" which has up till now been scrupulously spared. The battalion of the 2nd line is meanwhile brought close up as a support, and the whole of the 1st line is now hurled upon the enemy's position on the word "En avant!" "A la baionette!"

(*i.*) A successful assault is immediately followed up by the pursuit. If checked, fire is recommenced preparatory to the assault being renewed "Avec la plus grande energie," (a somewhat exorbitant demand to make on the troops unless there are sufficient fresh reserves in hand.

In order to gain a thorough comprehension of the above "general idea," the following observations may be of value :—

The "Tirailleurs" who originated in France and who upset the whole of "line tactics" a hundred years ago, are now disowned in the the French Regulations. No "line of skirmishers" exists as such, the whole firing line advancing shoulder to shoulder, unless intervals are expressly ordered. The whole frontage of a company of 240 rifles when extended amounts therefore to about 150 metres (160 yards.) The other companies intended to be employed in the front line have no "soutien" but are pushed up just as they are, complete.

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* Zug.

As regards formation for attack, it is laid down both for a regiment and brigade, that when "en cadrè" they are formed in 2 or 3 lines, when "isolè," always in 3 lines.

The fighting line advance by rushes ("par bonds successifs") from 400 metres (430 yards) onwards the reserve maintaining such formation as is best adopted to the nature of the ground for the time being.

The supporting body from the 2nd line, employed to push home the assault, is not brought up in line as the German and Russian attack, but in column.

Volley firing is employed against the enemy's cavalry. Should an attack be made on both flanks, a company column forms a "colonne contre la cavalrie" corresponding to the German "carrée."

Volleys are preferred by the French, though not to such an extent as in the Russian army. They are fixed as long as possible by "sections"* and sometimes by "peloton,"† and are said to be effective at the following ranges:—

* Zug. † Half companies.

Up to 800 metres (870 yards) or about the breadth of one group, up to 1000 metres (1080 yards) or about that of a "half section,"* up to 1200 metres (1300 yards) on that of a "section"† of infantry or section of artillery, up to 1500 metres (1600 yards) on extended formation, double section and company columns, against cavalry and artillery, up to 2000 metres (2200 yards) against columns in marching formation and massed bodies.

* Halbzug. † Zug.

This shews that the French allow a far greater spread to long range firing than the Germans, the reason being primarily their preference for volley firing. It is doubtful however, whether volley firing to this extent could be even satisfactory, at the intermediate ranges; indeed it would be almost impossible in the face of an enterprising enemy. As moreover it is essential to obtain superiority of fire at the medium or if possible at the long ranges, volley firing, as the principal kind of fire employed, scarcely fulfils the desired object.

At the end of 1870, volleys were employed by the Germans, and were adopted in their field training on the system advocated by the "Bavarian" Captain Mieg, but for the above reasons they were discontinued, far more value being placed on "individual" and "independent firing"† especially at decisive ranges.

† German "Schutzenfeuer."

In meeting an enemy therefore, that preferably adopts volleys, be it either the Russian or the French, the great object should be to carry the attack, rapidly and vigorously forward beyond the zone of long range fire, and up to the medium ranges.

At close ranges when volleys are almost impossible, and the patrols and eclaireurs have come in, the French substitute "independent firing" (feu à volonté) but there is no alternate firing by men of one file as in the German army. This "independent firing" is vigorously maintained and is soon succeeded by "feu rapide" when the men fix bayonets firing as many as 12 rounds per minute.

The greatest rapidity of fire is of course obtained by the use of the magazine ("feu a repetition") which is however only had recourse to at the supreme moment, and then only on the word of command from officers.

Firing without orders is limited as follows :—

Fire is (*a*) against an enemy under good cover at 200 metres (220 yards) (*b*) against men standing or kneeling at 300 metres (325 yards) (*c*) against single horsemen at 450 metres (490 yards) (*d*) a group of at least 4 men at 600 metres (650 yards).

Such rules must however be extremely difficult to maintain, and display an unmistakeable confession of distrust as regards the individual capabilities of the men. The system adopted in the German army is far simpler. With them, when within 600 metres (650 yards) aim may (not must) be taken at everything visible, between 600 and 1,000 metres (650 and 1,080 yards) aim is only taken at high and broad objects, while beyond 1,000 metres no firing takes place as a rule.

The "Lebel rifle" ("fusil modèle 86-93") has like the German rifle a point blank range, with a block sight at 250 metres (270 yards). Their sighting is indeed preferable to the German system, as they do not raise the back sight up till 800 metres (860 yards) whereas the latter raise the leaf at from 450-500 metres (490-540 yards). As with the Germans, any thing up to 600 metres (650 yards) is included under the heading "close ranges," but the medium ranges on the French system extend to 1,200 metres (1,300 yards) while those of Germans are limited to 1,000 metres (1,080 yards). Sights are adjusted as required and firing commences on the word "raise sight" (Ziel aufsitzew). Beyond 1,000 metres (1080 yards) 2 separate sights with 200 metres (220 yards) difference are used. This system is also adopted by the Germans but only with at least one section. Nothing is laid down in the regulations as regards firing on the move or indirect fire, both of which may safely be dispensed with.

"THE DEFENCE."

The main principles of the defence are also almost analogous in the three armies, the chief maxim being that the position chosen should be that which naturally and assisted by artificial defences enables the strongest and most effective fire to be delivered, and gives the best available cover to reserves in rear, and as a rule on a flank.

The "offensive" is also provided for on the same general lines, though somewhat differently carried out in detail.

According to the German regulations, a "defensive" which hopes for success, must be combined with a system of "attack."

The position and formation of the troops available is so arranged that local defences are held with a small force, and that sufficient reserve is at hand for the defence of the flank and to assume an energetic "offensive" on some special objective when an opportunity presents itself.

In the French army much more importance is attached to this latter point, the regulations running as follows:—*L' hypothèse d' une défense passive est repoussé absolument*

Whenever possible therefore small "contre attaques" (counter-attacks) should be carried out by a portion of the "Reserves," from the front of the position. These may sometimes resolve themselve into a general "offensive" action. The defence should otherwise be always maintained "à outrance."

The Russians apparently trouble themselves but little comparatively, as regards the offensive in the defence, the regulation merely observing that a counter-attack should be made when the assailants have almost reached the very position itself, and have pushed right beyond the skirmishers and supports with the bayonet. Fresh reserve troop are not called upon to assume "the offensive" until the assault has been repulsed without any prospect of its being renewed. This looks a if the Russians had to a certain extent abandoned their belief in the bayonet, although the latter had been looked upon at the national weapon since the days of Marshal Suwaroff, and is at the present time regarded by the fanatics as invincible.

Then again we find that the Russian regulations, in spite of being so far reaching and comprehensive, do not even point out the importance of obtaining superiority of fire. There appears moreover, to be a doubt as to whether the bullet or the bayonet is most to be relied upon, the result being that half measures are advocated, which are certainly not coducive to the full efficiency of either being obtained.

The weak points of the Russian attack seem to lie in their system of thin lines of skirmishers followed at a great distance by large reserves out of all proportion to the skirmishers. As regards their "defence," their weakness seems to lie in the fact that they are disinclined to convert the "defensive" into a vigorous "offensive."

Although similar in many points, the French system is undoubtedly superior to the Russian, the former making every adequate provision both for the attack and defence.

On the other hand there are several disadvantages to be urged as regards the French system such as the evident failure to rely upon independent thought and action on the part of commanders both high and low.

The Germans have a great pull in respect of their regulations, in that although they were not issued for 17 years after the last war, they have been adopted and carried out in the field, to the letter.

Implicit reliance is placed in the intelligence and common-sense of all commanders, and in the capabilities of the men even when without commanders.

When such a spirit is evolved of its own accord, it needs no official cognizance or encouragement.

LOCALIZATION OF RECRUITING FOR THE INFANTRY OF THE NATIVE ARMY.

By Captain A. A. J. Johnstone, 5th Punjab Infantry.

I.—The recent increase of the sepoy's pay has led to a decrease in the number of men who "cut their names" on completion of three years' service, still mixed regiments composed of several classes have to send out many recruiting parties annually to keep up their establishment. Each class requires a party at least once a year and it is difficult to spare native officers to command these.

Some companies are composed of men from two or three classes or districts, hence their regiments have to despatch yearly from 8 to 12 recruiting parties, of a total strength of from 40 to 60 non-commissioned officers and men, whose services are thus lost for some weeks at least. Some mixed regiments have men from as many as 16 districts and their Sikhs (if there are 3 or 4 companies) probably hail from 30 *tahsils*.

II.—The following arrangement is proposed in order to facilitate recruiting and admit of greater efficiency:—

Regiments to consist of not more than two classes, each wing having two companies of each class. Each class to be enlisted from one or more *tahsils* or, if necessary, from a whole district, and the recruiting area to be carefully defined and strictly adhered to. In non-Pathan regiments it might be advisable to have some trans-border Sikhs (say, a section), in the Sikh companies.

In the case of a class regiment, the arrangement would be similar to that of a two-class regiment, but of course more simple.

The undermentioned are some reasons for the proposed change.

(1.) Recruiting could be done (in communication with the District Recruiting Officer) by two British officers detailed from each regiment, one at a time for each class required. A small party of non-commissioned officers and men would accompany each officer.

(2) Discipline and class of men would be better because native officers would have an intimate knowledge of their men's caste, characters, and private affairs. It would be impossible for a low-caste man to enlist, except with his native officer's connivance.

At present a native officer has men in his company whose homes are, perhaps, scores and scores of miles from his own; how can he certify to their caste? Or how can be know anything of the truth, or otherwise, of their reasons for applying for leave on urgent private affairs?

(3.) Recruit's castes might be verified by the British regimental officers on recruiting duty. This is very imperfectly carried out at present under the orders of Deputy Commissioners.

(4.) *Esprit de corps* would be increased even more than by the present class regiments, as men of different districts do not always get on well together (this appears to be the case with Sikhs especially). British officers would probably take even more interest in, and be better acquainted with, their men when there were at most only two classes to deal with, and each wing commander would have experience of all the classes of which the regiment was composed.

(5.) Reservists, furlough, and leave men, would be called up much more easily and expeditiously than at present.

(6.) Service would be made more popular and recruiting more certain during a war or other emergency. In the Afghan war, regiments completed their increased establishments with some difficulty and this in spite of the enlistment (in some corps) of many low-caste men.

(7.) The Sikh recruiting grounds would be extended and Hindu *Jats* encouraged to take the *pahul*. These latter might not be as good stuff as that procurable from the present Sikh centres but they would, if of good physique, compare favourably (as regards field service qualifications) with the weedy specimens sometimes enlisted.

OCCASIONAL PAPERS AND RE-PRINTS.

THE FIELD TELEGRAPH IN CHITRAL.

Mr. P. V. Luke, C. B., Deputy-Director of Telegraphs in India, recently read a very interesting paper before the Mechanical Section of the British Association at Ipswich, on "The Working of the Field Telegraph in the Chitral Campaign."

The lecturer, in the course of his description of the operations of the telegraph department in Chitral, said the field telegraph required by the Army in India for the many small campaigns in which it finds itself engaged from time to time is supplied by the Civil Telegraph Department. In this respect it differs from the field telegraph of the Army in England, which is a military organisation under the management of the Royal Engineers. The wire used for the line was iron weighing 300 lb. or 150 lb. per mile, and standard hard copper weighing 80 lb. per mile, according to the local conditions. During the campaign in Waziristan last year a single wire was put up at the rate of nine miles a day for five consecutive days, in fairly open country, using poles procured locally. The maintenance of a telegraph line was quite as important as its construetion. Wire-cutting was always a favourite amusement with frontier tribes. They found the wire so useful. Sometimes, too, they converted the hollow iron posts of which the telegraph poles were made up into guns, by lapping them round with wire. They also cut the wire up for bullets.

As soon as information was received by the Director-General of Telegraphs that a force was to be mobilised and that a field telegraph was required for the Chitral expedition, the material for a two-wire line 200 miles in length, with 20 field offices, was at once sent off to Hoti-Mardan, which place, being in connection with the telegraph system of the country, was selected as the base of operations. The field line was started from Hoti-Mardan, and pushed on as fast as possible, crossing the frontier on April 1. The Malakand Pass was crossed on April 6, a telegraph office having been opened at the top of the pass very shortly after the fight. The Swat river was reached on the 10th, and the Panjkhora, 63 miles, on the 14th. The Jambatai Pass was crossed on the 22nd, after some delay on account of military difficulties, and an office was opened at Dir, 113 miles, on the 27th. The Lawari Pass, 10,500 feet, was reached on May 3rd. This pass was not practicable for camels, and all the camel transport was sent back from here. Owing to there being no mules available for the purpose, the telegraph stores could not be taken over the pass till May 14th, with the result that Chitral Fort—184 miles from Hoti-Mardan—was not reached until midnight of May 17th. As the General Officer Commanding the troops got to Chitral on the 16th, and left on the 18th, this delay was a great disappointment to the officer in charge of the telegraph. A single wire was put up in the first instance, but the heavy message traffic made it necessary to add others, and, eventually, there were three wires from Hoti-Mardan to Khar, on the Swat river, 34 miles; thence to Dir, 79 miles further, two wires: and on to Chitral, 71 miles more, one wire. In all, 327 miles of wire were put on 184 miles of posts, and 26 Field Telegraph offices were opened. The actual speed at which the line was constructed may be taken as an average of five miles a day for thirty-seven working days, but the actual distance covered in a day often exceeded this.

Taking the whole line into account, the country was not a very difficult one for a telegraph. In the Jandoul, Panjkhora, and Swat Valleys the heat experienced was intense, and there was a good deal of dysentery and fever. When putting up the second and third wires in the Hoti-Mardan to Khar section the work had to be stopped altogether between 10 A. M. and 4 P. M. Most of the troops, at any rate the Europeans, were moved up as soon as possible to hill stations on the Malakand, Laram, Janbatai, and Lowari passes, to elevations of 4,000 feet and upwards, where they were better off than in the plains of India. Curiously enough, there was, at first, great freedom from wire-cutting, due, perhaps, to the severe lesson of the Malakand fight; but in May the trouble, which experience in other campaigns foreshadowed, began, and up to the beginning of July interruptions aggregating to six and a half days were caused by the cutting and stealing of the wire. The latest advices from India show that up to the middle of October the cutting of the wire at frequent intervals still continued. Most of the cutting has been in the Jandoul valley, the home of Umra Khan, by which route the telegraph was originally taken. Jandoul has now been evacuated and the wire removed to follow the Panjkhora river route, and it is now to be expected that there will be few depredations of the kind.

Considering that storms were frequent and violent, there had been very few interruptions caused by them. At first a good deal of trouble was experienced from camels and other transport animals rubbing against the poles and breaking them, A little summary justice dealt out among the owners of offending animals had the effect of diminishing interruptions from this source. There was great difficulty in working off the very heavy message traffic, especially at the beginning, when the Staff were new to the work. The messages were unusually long, the number of words in each averaging over fifty, which is about double the average of the ordinary messages in India In April the number of messages passing over the field-line was 24,370, and in May 58,935, and, doubling these figures for purposes of comparison, it would be seen that the traffic was very heavy for a field line. The increase in State messages for the month of March for all India, as compared with March 1894, although active operations did not commence till the close of the month, was 28 per cent. in number and no less than 107 per cent. in their value. This increase was chiefly in the Punjab, where the State work, as compared with 1894, increased nearly five-fold, and it will give some idea of the use that is made by the telegraph in time of war. One day in April, shortly after the Malakand fight, the telegraph line was cleared between Simla and Sadon on the Panjkhora river, a distance of 596 miles, to enable the Commander-in-Chief in India to talk direct with General Low, commanding the Chitral Relief Force. Notwithstanding that heavy rain was falling in the Swat Hills, the communication was excellent, a great deal of work was done, and the military authorities expressed themselves as highly pleased with the efficiency of the service.—*Army and Navy Gazette.*

THE MILITARY RESOURCES OF THE SOUTH AFRICAN REPUBLIC.

Translated from the Revue du Cercle Militaire, by Captain A. H. BINGLEY, *7th (D. C. O.) B. I.*

All Transvaal subjects between 16 and 60 years of age are liable for service, and natives whose chiefs have accepted the protectorate of the South African Republic can also be employed in its military forces.

If all the Boers responded to a levy *en masse*, the mobilizable troops of the Republic would amount to the following considerable numbers :—

13,500 men from 18 to 34 years of age.
6,600 men „ 34 to 50 ditto.
3,900 men „ less than 18 or more than 50 years of age.

or a total of about 24,000 men.

The native tribes of the Rustenberg, Pretoria, Middleburg, Lydenburg, Waterberg, Zoutspansberg, and Lichtenburg districts would furnish another 60,000 men commanded by their own chiefs, but the fidelity of these auxiliaries could hardly be relied on.

There is besides a corps of police, and a corps of artillery largely composed of Germans. The latter consists of 7 Officers, 4 Sergeants, 8 Corporals, 1 Armourer, and 100 men.

The armament includes 6 light Krupp field guns, 6 heavy Krupp guns, and the following quick firers—4 light Maxims, 2 heavy Maxims, 1 rifled muzzle loader, and a French mitrailleuse. To the permanent force must be added a field telegraph section composed of 1 Officer and 15 men.

The system of mobilization is not to be despised. In 1890 an order to assemble at Johannesburg issued at 6 in the evening, resulted in the assembly of 800 mounted Boers by 5 the following morning.

The order to mobilize is given by the President of the Republic to the Commander of the Forces (General Joubert); the latter transmits it to the Commandants of the 17 military districts, and the latter pass it on to the 64 Field Cornets who are in charge of the 64 administrative circles unto which the countries is divided.

The only weapon which the Boer receives from his Government is a Martini Henry rifle, and in lieu of uniform he wears his own clothing which is admirably suited to campaigning.

The Commander of the Forces, General Joubert, is a soldier who has proved his capacity in the field. He is a member of the 2nd class of the Prussian order of the Red Eagle.—*Revue du Cercle Militaire.*

PRESENT STATE OF THE WORKS OF THE TRANS-SIBERIAN RAILWAY.

(WITH MAP.)

Translated from the "Revue Militaire de l' Etranger" by Captain P. H. DU P. CASGRAIN, R. E.

Before giving an account of the present state of the works, it seems desirable to recapitulate briefly the route and the general conditions governing the construction of the Trans-Siberian Railway, commenced some years ago.

According to the plans sanctioned in 1891, the main line of the railway, which had already reached Tcheliabinsk, was to be prolonged through Omsk, Tomsk, Krasnoiarsk, Irkoutsk, go round the Baikal, and then *vid* Tchita, Stretensk, Khabarovka, reaching the Pacific Ocean at Vladivostok. The total length of the line was to be about 7,600 kilomètres.

The works were to be undertaken in the following order of urgency:—

1st. The Western and Siberian Sections, viz., from Tcheliabinsk to Tomsk and Irkoutsk (about 300 kilomètres), and from Irkoutsk to Lisvenitchnaia, on the Western shore of Lake Baikal (30 kilomètres).

Section from Vladivostok to Grafskaia (408 kilomètres) commenced prior to 1891.

Junction with the Ural Railway from Tcheliabinsk to Ekaterinbourg.

2nd. Section from Mysovaia (on the east shore of Lake Baikal) to Stretensk (1,176 kilomètres).

Section from Grafskaia to Khabarovka (370 kilomètres).

3rd. Belt Line Section around the south shore of Lake Baikal, from Irkoutsk to Mysovaia (312 kilomètres).

Section from Stretensk to Khobarovka (2,130 kilomètres).

From the above it will be seen that work was to be commenced from both ends of the line, and that the Western Siberian sections were to be constructed first.

These sections form a direct prolongation of the existing Russian lines, and their construction does not present any great difficulty.

The belt line around Lake Baikal and the section from Stretensk to Khabarovka were to be constructed last of all. It was, as a matter of fact, possible to do without these two sections by using the alternative route *viâ* Lake Baikal and the Amour and its tributaries.*

According to the estimates, the most important sections of the road, viz., from Tcheliabinsk to Irkoutsk on one side, and from Khabarovka to Vladivostok on the other, were to be opened in 1900, and the whole road was to be ready for traffic in 1904.

As the work progressed the Russians became more and more alive to the importance of the line, from a commercial as well as from a political and military point of view. The best proof of the interest taken in the undertaking is that the Emperor Nicholas insisted on retaining, after his accession, the presidency of the committee of the Trans-Siberian Railway. The work has, therefore, been pushed on with great energy, and although it is impossible to fix an exact date for the completion of the road, we may safely say that it will be completed, or at all events the Western and Central Siberian sections, long before the estimated date.

State of the Work on the 1-13th January, 1895.

According to the information supplied by the *Government News (Pravitelstoennyi Vestnik)*, the following was the state of progress on the 1-13th January, 1895.

I.—Western Siberia.

From Tcheliabinsk to Omsk (742 versts, 800 kilomètres approximately).—The earthwork is completed, as well as most of the culverts, bridges, etc. There only remains to construct three large iron bridges over the Tobol, Ichim, and Irtych, and, moreover, the masonry work for the piers and abutments for these bridges has been begun. These bridges are of such large dimensions, and the work is so difficult, and distance from the iron works so considerable, that they will probably not be completed before 1896. It will be necessary meanwhile to construct temporary wooden bridges. This will also be done in the case of the large rivers which are met with in the other sections.

The construction of the buildings and accessories (such as station houses, sheds for locomotives, turn tables, water towers etc., etc.) necessary for operating the line is almost completed.

The rails are laid over the whole length of the section, and 550 versts have been ballasted.†

The section has been provided with 29 locomotives, 3 passenger carriages, and 1,010 trucks necessary to operate the road temporarily opened for traffic between Tcheliabinsk and Irtych. The first passenger train went over the section on the 25th November (6th December), 1894.

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* The Chilka, a tributary of the Amour, is navigable from Streteusk for ships of light draught. Fairly large ships can navigate the Amour from Pokrovskaia.

† The length of the verst is 1,067 mètres

From Omsk to Obi.—About 75 per cent. of the earth-work for the roadway, and 50 per cent. of the earthwork for the station sites, have been completed.

Most of the bridges, culverts, etc., have been completed, and a large bridge for which the materials have been collected, the caissons sunk, and the masonry work commenced, is being constructed over the Obi. (This bridge promises to be one of the most important *travaux d' art* of the Trans-Siberian Railway) The Russian newspapers say that a large number of mechanics, amongst whom were many Italians and Belgians, have been employed on its construction since the spring of 1894. A certain number of station buildings are already completed, and part of the rolling stock is on the spot. The rails are laid for a distance of 120 versts from Omsk. Finally, the sections have been provided with 11 locomotives, 2 passenger cars, and 400 trucks.

Tcheliabinsk-Ekaterinbourg Section.—For this section, which is to join the Trans-Siberian to the system which serves the mining and manufacturing district of the Ural, the plans and estimates have been completed.

The earthwork is in progress, and about 5 per cent. of it is completed.

II.—Central Siberia,

From Obi to Krasnoiarsk.—The earthwork, culverts and bridges are fairly well advanced (99 wooden bridges have been built, and 51 are in course of construction).

The masonry work for piers and abutments for six bridges is in progress, and the masonry work for three other bridges is completed. Work on the bridge over the Tom has been commenced, and the caissons are being sunk. Finally, nearly a quarter of the buildings and rolling stock necessary to operate the line are ready. Rails have been laid down for a distance of 206 versts on the main line and sidings. The section has been provided with 17 locomotives and 560 trucks

From Krasnoiarsk to Irkoutsk.—The surveys and estimates have been completed. The work is only commenced.

From Irkoutsk to Lisvenitchnaia.—On Lake Baikal the necessary surveys have been completed, and the plans and estimates are in hand.

III. —Transbaikolia.

From Mysovaia to Pokrovskalia.—This section is in the same state of progress as the previous one.

With regard to the particularly difficult section around the southern end of the lake, between Lisvenitchnaia and Mysovaia, surveys are now being made.

To facilitate the crossing of Lake Baikal, pending the construction of that part of the road, which will probably be the last section to be completed, surveys are being carried out with a view to improving the ports of Lisvenitchnaia and Mysovaia.

IV.—Province of Amour.

For the construction of the section between Pokrovskaia and Khabarovka, preliminary surveys have already been made, and barometrical levels taken in 1894. In January last eight field parties of engineers were sent out to carry out technical and geological surveys.

V.—Province of the Oussouri.

The heavy rains and floods during 1894 considerably retarded the progress of the work on the sections which pass through the province of Oussouri, but, nevertheless, the work is fairly well advanced.

From Khabarovka to Grafskaia.—The earthwork, and some of the bridges, culverts, etc., are completed. Some of the station buildings have been erected, and the necessary plant collected.

Rails are laid for a distance of 11 versts from Grafskaia.

From Grafskaia to Vladivostok.—The work is almost completed. There remains to erect a few iron bridges to replace the wooden ones temporarily constructed over the Oussouri and other large rivers, The station buildings and their accessories necessary to operate the line are also almost completed.

The rails are laid the whole length of the section (388 versts approximately). and 190 versts of road have been ballasted.

The section has been provided with 27 locomotives, 372 trucks, and 19 passenger cars of different classes, necessary to operate the line temporarily opened for traffic between Vladivostok and Grafskaia.

In summing up the above data it will be seen that out of a distance of 7,600 kilomètres, which is the total length of the Trans-Siberian Railway, there are about 1,230 versts already opened for traffic, and that the rails are laid for a distance of 1,600 kilomètres.

At the same time steps have been taken to facilitate the navigation of the Obi, Ienissei and their tributaries. This vast network of rivers has been, and will be, of immense assistance for the transport of the materials and plant necessary for the construction and operation of the road. It was only by making use of these rivers that it was possible to commence work simultaneously on the Western and Central Siberian sections.

Thus, for example, 1,500 tons of rails necessary for the construction of the above-mentioned sections of the road were bought in England, and conveyed in 1893 in an English steamer to the mouth of the Ieinissei. Thence, during 1894, they were brought by boat as far a Krasnoiarsk. The naval officers who had charge of the transportation of the rails found that large ships could go up the Ienissei to a distance of 1,600 kilomètres from its mouth.

Surveys were successfully carried out, and revealed the existence of coal in the basin of the Obi at various places within convenient distance of the line.

The events which have taken place in 1894-95 in the Far East have caused the construction of the road to be pushed on with still greater activity. The Russians must have seen of what immense moral and material importance the Trans-Siberian Railway would have been. They felt the necessity of hastening its completion as much as possible, realising its importance for the future extension of Russian domination in the Far East, and remembering the impression produced on the Japanese by

Russia's intervention in their war with China. The Russian papers recently again alluded "to the great energy displayed by the Committee of the Siberian Railway in constantly adopting measures all tending to accelerate the construction of the line."

The proceedings of the meeting of the committee, held under the presidency of the Emperor, corroborate these statements.

At the meeting held on the 2nd January, it was decided "to make a special survey of that section of the Trans-Siberian Railway which lies in the province of the Amour between Khabarovka and Blagovetchensk. Thus it will be possible to commence work on the above-mentioned section as soon as the earthwork of the Oussouri section is completed, *i. e.*, about 1896."

At another meeting it was decided to buy specially constructed ships to go through ice, for the purpose of keeping open a channel between Mysovaia and Lisvenitchnaia on Lake Baikal.

Finally it was found advantageous to make use to a large extent of the labour of Siberian convicts and exiles, their employment having proved of great assistance during the season of 1894.

At the last meeting, held last May, fresh measures were adopted. It was decided to commence at once the construction of the Irkoutsk-Lisvenitchnaia section on lake Baikal, and a credit of 2.216,735 roubles was voted for that purpose. It was also decided to commence work at once on the Transbaikalia (Mysovaia-Pokrovshaia) section. This was considered indispensable, "because thus only would it be possible to carry out the Imperial order fixing the opening for traffic of this section at 1898."

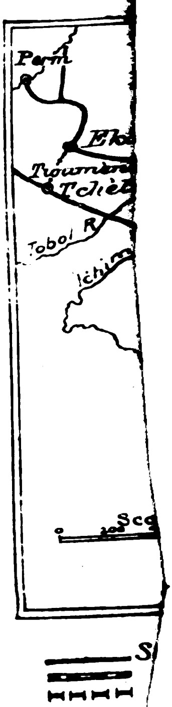
As no detail surveys had yet been made, it was impossible to prepare a sufficiently accurate estimate of the cost of the work of this section. and a first credit of 3,000,000 was therefore voted. Additional surveys will be made in 1895, so that by 1896 it will be possible to frame a fairly accurate estimate. Every endeavour is to be made to reduce the cost of the line between Streteusk and Pokrovshaia, which at present is estimated at 90,000 roubles per verst.

Until further orders, and pending a decision as to the ruling gradients, &c &c., particular to the Transbaikalia section, it has been decided to adopt those which were in force in the Central Siberian section. There will be no inconvenience in so doing this year, for in the district where work is to be commenced there appears to be no necessity for using the ruling gradients authorized for the Central Siberian section.

It seems also necessary to mention, as tending to accelerate the work, the formation of detachments of railway workmen in the province of the Oussouri. These detachments will he furnished by the battalions of Chasseurs of Eastern Siberia.

Finally, it was decided on the 25th May (6th June) to raise a railway battalion for work in the Oussouri.

To sum up, we may infer from the adoption of such measures that the work will now be pushed on with renewed energy. It is probable that, as the Russian papers said, the road will be open for traffic as far as Krasnoiarsk at the end of the 1895 season.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At the very commencement of the work it was recognized in Russia that, in order to give to the Trans-Siberian its full military and commercial value, it was necessary that it should have for its terminus a port which would fulfil all commercial and military requirements.

Surveys were commenced, and are still going on, with a view of finding in Vladivostok Bay a suitable commercial harbour, near the military port established there a few years ago.

It is, however, necessary to state that the Russian press, especially of late, has often expressed the opinion that Vladivostok does not satisfactorily fulfil its purpose.

The winters are very severe, the thermometer being frequently down to 30° to 35°, and the harbour frozen over for a period of four months.

The disadvantages, both from a commercial and military point of view, of climatic conditions so unfavourable to navigation are too obvious to need any explanation.

Endeavours were made to overcome this difficulty by making use of ships *(brise-glaces)* specially constructed to break the ice, and it was by this means that a ship of the volunteer fleet was able to enter the port last January, land its cargo, and start again for Odessa. (This had never been done before).

But this seems to be but a temporary measure, and the Russian press says that even with the assistance of *brise-glaces* Vladivostok will never fill the place of an open port. What Russia wants is a port where her navy can anchor at all seasons, and come in and out at all seasons, and which will be always open for trade. "If the Trans-Siberian Railway ends at Vladivostok it will lose half the value it would have were it to have for its terminus an open port."

It is with a view to meet these requirements that the Russian press has frequently advocated, especially since the commencement of the war between China and Japan, the acquisition of a free port on the Corean coast (Cherbatow, Lazarev, etc.). It has, in consequence of this proposal, been suggesed to alter the route of the Trans Siberian Railway and to shorten it. The new line, starting from Transbaikalia, would run straight across Manchuria to the Corean coast, either with the sanction of the Chinese Government, or after the province had been annexed to the Russian possessions. The new line would have the advantage of being shorter and easier to construct.

Finally, it was said only recently that the Russian Government had obtained China's sanction to run the main line or a branch line in a southerly direction through Manchuria to a point near the mouth of the Yalu, at a short distance from Port Arthur.

It does not rest with us to consider how far the wishes expressed by the Russian press will be realized; we will, besides, soon know what arrangement, temporary or otherwise, has been arrived at. It appears to us, however, that if the question is solved by arriving at an arrangement by which the railway would run through Manchuria whilst the province would remain under Chinese Government, such a solution would be of little practical value, and would probably give rise to grave difficulties.

For commercial purposes such an arrangement might possibly prove satisfactory, but for military purposes it would be undesirable. In order that the Trans-Siberian Railway should have its full value, both from a military and commercial point of view, it is obvious that it should have for its terminus an open port, and that to reach such a port it should pass through provinces which should be completely under Russian domination.—*Royal Engineer Journal.*

CONDENSED RATIONS IN WAR.

The recent experiments carried out in the United States Army by order of the Secretary for War with a view to reducing the bulk and weight of food without impairing its nutritive functions, serve to confirm the belief that the exclusive use of concentrated foods cannot be continued for any length of time without prejudicial results to the health and efficiency of the consumers. Necessity, however, knows no laws, and as "an army fights on its belly," so in war time it must live *sur les magasins ou sur le pays.* In the rapid movements of modern war when the transport has to be reduced to a minimum, or when an army passes over a country previously exhausted by the enemy; during the period of grand concentrations which precede and follow a battle, when all requistionable supplies in a limited zone of territory will have disappeared in a few hours; and "for the decisive moments of the crisis;" the importance of condensed and ready-cooked food may be inestimable. Accidents again, arising from causes sometimes absolutely impossible to avoid, *e. g.*, the blowing up of a bridge, a flood, an accident on the railway, the capture of a convoy, or the like, may cause the men to be without food for so many hours as to exhaust them greatly, and some actions have been lost, other have remained infructuous, almost entirely from this cause. This can only be avoided by carrying compressed rations so as to make the troops independent of the supply trains for seven or eight days on emergencies, and to enable them to prepare their food under any circumstances the moment the march or battle is over.

In the German Army each soldier carries in his pack a three day's ration, to render him temporarily independent of the regular daily issues. This is the so-called "iron-ration," composed of 3 lb. 4oz. of biscuit, 13¼oz. of rice, 2½oz. of salt, 1 lb. 2½oz. of bacon, and nearly 2¾oz. of roasted ground coffee: it is to be used when all other means for feeding the soldier fail, and then only by direction of superior authority. The ration is frequently inspected, and any unauthorised expenditure of it is severely punished. It is, no doubt, a meagre diet to work upon for a few days, but if nothing more, it would always constitute a basis to which the supply officers would add anything they could lay their hands on. Without it there is at times no alternative but—to starve. In the Austro-Hungarian Army the reserve food-supply carried by each man consist of 17·6oz. of biscuit, 7oz. of preserved meat, 1$\frac{8}{10}$oz. of preserved soup, salt 2oz., tobacco 2·4oz. The French soldier carries in his knapsack two days' ration of biscuit (3¼lb.) one days' ration of dried vegetables 2⅛oz), three days' ration of rice (3⅕oz.), four rations of coffee and sugar, and two days' rations of preserved meat (14⅛oz,) To make these up to four days' supply, two days' rations of bread and fresh meat are provided by the *approvisionements des transports stratégiques.* The soldiers of the Japanese Army, in the late war with China, carried an emergency ration of rice in a little tin case strapped to the top of their knapsacks. In the British Army alone nothing has yet been done in this direction beyond the manufacture of a "meat-biscuit" of sorts by the Commissariat Department. When any rapid movement is made, the soldier is ordered to carry a couple of days' ordinary cooked rations in his haversack, bulky in size and very liable to deterioration when carried for several consecutive hours on a hot day.

It is obvious that fresh meat and bread can have no place in an emergency ration: the constituents must be such as will keep well, be compressed in small bulk, and give in minimum compass the greatest amount of nourishment. But the experience of all campaigns proves that the great desideratum is the invention of a process of preparing and preserving alimentary substances in such a way that, while reducing their volume and weight, it will not diminish their nutritive yield. Trials are being constantly made in the great military kitchen of Mayence with this object, and it may be confidently predicted that the fortunate patentee of a thoroughly satisfactory process will reap a rich harvest. The pea-sausage (Erbswurst) made by mixing pea-flour and fat pork with a little salt, was highly prized for a time by the Germans in the Franco-German war, and the inventor received a bonus of 30,000 thalers (£4,500). It has been much improved since then. There are numerous articles in the market out of which a good emergency ration could be made, *e g.*, streaky bacon (8oz.) or pressed corned beef (12oz.) or a box of sardiness (12oz) combined with a tablet of pea meal mixed with Hassall's flour of meat for soup, an oblong tablet of chocolate and milk divided by marks into three portions (each weighing 1 oz. to make one pint), oatmeal biscuits (12oz. of water), or compressed bread (1 lb.) per cent., the whole ration for one day not weighing more than 2lb. and contained in two rectangular tin or aluminium cases for convenience of package in the valise, haversack, or the pockets of the greatcoat. Coffee and cheese do not keep well in hot moist countries, and as for salt the old soldier knows too well its priceless value on service ever to be without a supply of it.

If reports speak true, there were times in the early days of the late Chitral campaign, when, owing to the almost insuperable difficulties with which the supply officers had to contend, a ration modelled on the above scale would have been a great boon to both officers and men. Theoretically speaking, the amount of water-free food required to keep the body in full activity has been calculated to be about 26oz., but in practice the dehydration and compression produced by this amount of concentration not only appear to affect the alimentary value of the substances concerned, but also to lessen their digestibility and assimilation.

This has been particularly observed in the case of fresh vegetables desiccated and subjected to enormous pressure in a hydraulic press (Chollet's process). A sudden change from ordinary field-rations to this class of diet must also exercise some influence in producing the sensation of hunger, indigestion, and intestinal troubles, which are sometimes associated with the exclusive consumption of condensed food. But all this goes to prove that the latter should be considered as a *reserve* kept in readiness for *occasional* issue on emergencies, and given if possible *in addition* to the usual rations issued by the Supply Departments. In the late experiments in Colorado, various concentrated food tablets were employed, but it is said that more than half the men who were victims to the experiment became candidates for hospital treatment. For instance the report states:—"A company of the 7th Infantry at Fort Logan, near Denver, was detailed, and furnished with condensed rations consisting of coffee, soup, bread, and bacon. The coffee, and soup were in small tablets, which when placed in boiling water, were ready for consumption in two minutes. The bread was in small flat cakes, the weight and hardness of brick, but when moistened, swelled out like a sponge. The bacon was compressed, and needed only to be warmed in a frying pan. The soldiers started out with 10 days' rations, but the campaign was brought to an abrupt end after four days' of 15-mile marches. The food not only did not satisfy the hunger or give strength, but seemed to irritate the stomach. After the first meal, two of the enlisted men had to be placed under the surgeon's care. At the end of the second day, thirty out of the seventy men in the company were ill, and on the fourth day the whole command went into camp, and couriers were sent to town for hard tack and ordinary coffee and bacon. Some of the soldiers were seriously ill with stomach complaint, and were confined to the hospital for several days." Assuming that these rations were of good quality, and that the soldiers were healthy men, with sound teeth and ordinary digestive capacities; it is hard to reconcile the bad effects quoted above with the experiences of the Burma and Nile campaigns when our soldiers were fed almost exclusively on "bully beef" and ration-biscuit, and yet though they endured great hardships, and did a maximum amount of work, there is no evidence to show that they suffered unduly in health from the food issued to them. The men however, thoroughly disliked these rations after a time, and wasted them recklessly. The want of variety was of course very objectionable, and there were grumblings on this score.

Few will agree with the American authorities that ration-biscuit (hard tack), though undoubtedly possessing many advantages as being easily transportable, and as being bulk for bulk more nutritious than bread, is the most practical service food obtainable. On the countrary its use is not free from grave objections. It is deficient in fat, after a time it seems difficult of digestion, and certain it is that men do not thrive well upon it for long periods. In war it has always been the rule with the best army surgeons for more than a century to regard it as *un aliment de necessité* to be issued only in cases where it cannot be avoided. This is owing to the great difficnlty, if not impossiblity for ordinary mortals except those endowed with cast-iron "mouth furniture" to masticate the tough morsels, the only remedy being to steep them in water, which makes them pulpy and unpalatable, or in coffee, soup, or other kindred beverages, which is not always practicable. If eaten in the dry state, and insufficiently triturated, the hard angular fragments act as a mechanical irritant, and cause what is well known to and called by the French soldier *la diarrhée du biscuit*. Tommy Atkins equally with his French *confrère* simply loathes it, and so great is the repugnance of the latter to the obnoxious aliment that according to Véry (Encyclopédie d'Hygiene) out of 122,000 quintaux that were issued only 200 were consumed, the waste representing a loss to the Government of 5,000,000 francs (£200,000).

The history of the attempts and failures for the past few years of the Intendance of the French army to provide a remedy for this disastrous state of things by replacing biscuit by a suitable *pain de guerre*, is very interesting. At first an attempt was made to dessicate the ammunition bread, but the plain had to be abandoned. It was found after exhaustive experiments in the military bake-houses that in order to bring down the water in a loaf weighing 750 grammes (26oz.) to 12 or 14 per cent, a period of between 30 and 40 days was required: and moreover that when the residuum was remoistened for use, its edible qualities were far from satisfactory. According to the *Medical Magazine* private enterprise was now enlisted, the result being a long series of failures, all more or less complete. At last in December 1892, the Administration resolved on making an extended trial of the compressed bread of Perrier, and a large quantity was issued to the Army. After a two years' trial both in France and Algeria, the reports called for were fairly favourable, but before coming to a definite conclusion in the matter the Minister of War issued a circular, dated 10th April 1894, calling on all persons engaged in the baking trade to enter into competition for the production of a war-bread, that is to say, "a substance occupying very small space, but including, nevertheless, the whole of the qualities, nutritive and digestive, of ordinary bread." According to the terms of the circular, the required product was to keep good for a year, without manifesting the slightest sign of deterioration. Its dimensions should admit of its being packed in the soldier's valise, and its substance should be sufficiently resistant to withstand the shocks and compression of ordinary transport. The materials used were to consist exclusively of soft wheaten flour, paste, leaven, water, and salt. In shape each portion was to be square or rectangular, with a due proportion of crust: the crumb was to be white and porous: and the taste and smell both agreeable to the senses. Finally, the siccity must be perfect, there must be no crumbling, and every loaf must swell out completely to the standard size within ten minutes immersion in water at 50° C. These specifications constituted a "tall" order, and as the competition seems to have failed to produce a specimen superior to Perrier's compressed bread, the latter has been now definitely adopted in the French Service. The issue of biscuit to the troops ceased on the 1st January 1895. As this measure is bound to exercise a very important effect on the well-being and efficiency of the soldier on active service, it is to be hoped that the Government of India will recognise the expediency of taking up the matter offering, say, as a first step, a prize for the best specimen of a compressed 1lb war-loaf fulfilling the conditions laid down in the above quoted circular of the French Minister of War.—*Pioneer.*

A LESSON IN THE HYGIENE OF WAR.

Those who give but a passing thought to the duties of the Military medical officer are apt to regard him as professionally responsible for the sick in peace time, for the wounded in war, and nothing more. Yet these responsibilities are in reality among the lightest of his functions. The primary aim of his position—for it is the most important one—is to advise upon and regulate everything that can keep the army in good health. He can proudly say with Turenne: "The most precious thing in life to me is the health of the soldier." He is, in short, not merely the healer but the preventer of disease. As hygiene embraces everything that pertains to the preservation as distinguished from the recuperation of health, the country looks up to the medical officer as the custodian and expounder of hygienic laws. In relation to the State, prevention is not only better than cure, it is infinitely cheaper. Thus it comes to be accepted that whether in quarters or in the field the sanitation of the army in its broadest sense, the clothing, cooking, feeding, water-supply, disposal of filth, site for encampment, regulation of sleep to work, and the infinite complexities of suggestion and forethought, which these and kindred important questions involve, are regarded as the distinctive province of the medical officer. In actual battle, if lives are recklessly sacrificed, the blame belongs to the officer in command. If, apart from casualties due to the enemy, the mortality from sickness is avoidably high, the blame *prima facie* is attachable to the medical arrangements. It is then for the Medical Department to prove that its officers were true to their salt and left nothing undone by way of advice and respectful remonstrance to make the General alive to the hygienic safeguards which should be provided for the men. The medical officer has only an advisory office. He cannot force the military authorities to carry out the sanitary proposals he submits, but the General is perfectly aware that he can only defy them at his peril. If in consequence of disregard of reasonable representations from the doctor, the health of the men breaks down, and waste of life results, the country will not be slow to place the reproach on culpable shoulders. This duty of advice, which by thoughtless men is apt to be resented as dictation, is probably at the root of a certain ill-defined spirit of antagonism between executive officers in the field and the medical staff—a spirit which unfortunately seems to be traditionary in all armies.

This power in the hand of the Medical Department to regulate and curb defiance of sanitary rules, no matter how high the military officer in command, is of enormous importance and should be jealously guarded.

It is the only power effectual on the spot to prevent avoidable mortality. Of course every officer is as keen to the doctor is to keep the men in good health, but the best of men whose profession is to kill, not to cure, have not the expert training that is required of a doctor, and, disdainful of advice, are apt to make the most disastrous mistakes regarding, let us say, the site for an encampment, the limits of fatigue, the need for extra food, or a daily preventive dose of anti-malarial medicine. The modern General is a paragon of accomplishments compared with the men of old times, but experience proves that he is just as capable, through ignorance, of throwing away the lives of men as some of his prototypes were through recklessness. If we want this moral pointed it is not necessary to go back to the Marlborough or Crimean wars. It is under our eyes in the Madagascar expedition. There was a practically bloodless war, yet 8,000 men were sick in the various hospitals at one time; there were 4,000 deaths up to September 30th, and men were dying at the rate 45 a day! If such a story had to be told of any English expedition in this decade of the century, a cry of indignant horror would spring from the heart of every Englishman, to which the anger raised by the Crimean breakdown would be put a pale lament. The French people themselves seem thoroughly horror-stricken at this picture of what seems the utterly wanton self-inflicted hardships of war.

It remains to be seen what action their Government will take to investigate the causes and bring home with a heavy hand their culpability to the responsible parties. Already we get glimpses here and there of what has occurred, and the lesson is one well worth taking to heart, not merely by military men, but by all who esteem and love and pay for the army. So far as it is possible to construe plain statement of facts without any need whatever of reading between the lines, the French mortality in Madagascar seems to have been easily avoidable and was practically altogether due to defiance of medical opinion. An officer, who publishes his diary in a Paris paper, shows that the deplorable health of the troops was due in the first place to General Metzinger, who considered the fever "a myth." General Duchesne is stated to be also responsible for constantly refusing to adopt those preventive measures which were declared by the doctors to be indispensable. Detachments were sent off without any medicines, and all sanitary precautions were disregarded by the military executive, even with regard to men who had fallen sick. Pasteur filters, which had wrought such good in France, were left there where they were less needed than in malarial jungles where men were exposed to the hardships of war. Even such simple drugs as aperients were found wanting. This and other testimony like it warrants the conclusion of the *British Medical Journal*: "The fact is that throughout the campaign the work of the Medical staff was hindered and crippled in the most deplorable manner by military pedantry and obstructiveness."

That there was tension between General Duchesne and the Medical staff of the Expedition must be evident from these circumstances and from the most pointed one of all. In sending in the names recommended for the cross of the Legion of Honour, not a single doctor is found upon our ammunition trains would not stand this drain. It is satisfactory to know that experiments are being carried out which will probably result in a service bullet being made that will meet all the requirements of savage warfare. When this point has been reached there will be nothing lacking in the equipment of our infantry, and our border campaigns should be remarkable in the future for the ease with which even the strongest positions are forced and the heavy loss inflicted upon the tribal levies encountered. The general use of the Maxim, too, will materially strengthen the offensive power of our troops.—*Bombay Gazette.*

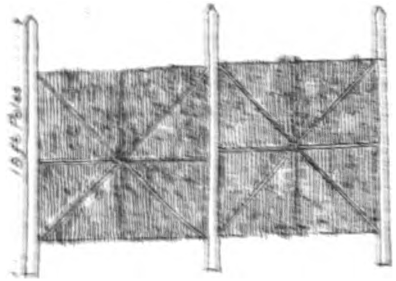
THE COST OF CONQUEST.

An article which appeared a short time ago in *La France Militaire* gives a table of the deaths per thousand among French troops that garrison their colonies. The following are the stations where the mortality is heaviest: Martinique and Guadaloupe 50, Madagascar (1886) 75, Tonkin 77, and Guiana 237 per 1,000. No branch of the service suffers so terribly as the marine infantry, who are always in demand for distant expenditions and for garrison duty in unhealthy posts. Their average mortality is about 70 per 1,000 for the rank and file and 90 per 1000 for their officers. When we look at our own bills of mortality, and see the deaths in the European army in India only amounting to 12·61 per 1,000 in 1893, we have doubtless good grounds for the heartiest satisfaction. It is good for us to have reached this high water, mark and doubtless, as the glories of sanitary progress are still in the ascendant, we are within easy reach of the goal of the medical prophets, when the ratio of deaths shall fall to one per cent. Face to face with the progress we have attained, it would ill become us to shut our eyes against the records of the past. The splendid achievements of our countrymen which brought to the foot of England's throne the conquest of an empire ought not to blind us to the holocaust of human life which paid for it. If one fact stands out preeminent and irresistible, it is this, that the immense saving of life among our troops is due to the march of sanitation, and that it is due entirely to the small band of men who get very little glory for it and often still less thanks, the medical officers of the army. The death rate of the European army in India—we do not refer in this article to native troops—from 1770 to 1799 was 59 per thousand. From 1800 to 1829 it rose to 85. From 1830 to 1856 it fell to 58, so that, in the words of the Commissioners appointed to inquire into the sanitary state of the army in India, "the death-rate of the British soldier since the first occupation of the country down to the present day (1863) has oscillated round 69 per 1000." Men of the soldier's age in the healthy parts of England only furnished 8 deaths per 1,000, while in the unhealthy parts of England and working at the unhealthiest trades the rate was 12 per 1,000. The home mortality of the British army in those days was 17 per 1,000, so that over 50 men per 1,000 of the Indian army died annually in excess of the ratio in the home army, and about 60 per 1,000 in excess of the ratio existing among men of the civil population at home of the military age. Thus 1,000 effectives, equivalent to a regiment, died off in about 20 years from the fact of their service being in India. It must not be thought that this terrible mortality was due to the fortunes of war. Deaths in action, or resulting therefrom, even when the fighting was hottest and most widespread, scarcely amounted to 1 in the 39 years, 1817-55, when the mean strength of the Royal army in India was 20,332 and the deaths 55,584, giving a mortality of 70 per 1,000. Yet the Mahratta, Pindaree, Burmese, Afghan, Sind, Sutlej, Punjab, and Chinese campaigns account for only 10 out of the 70. The mean term of service in India worked out to 8·6 years, and 11 recruits were required annually to every 100 men. To maintain the strength of the army in India at 85,000, as it stood in 1861, 10,000 annual recruits were needed even under the Company's regulations of long service. Yet in eight years these recruits were reduced to less than half their original number. Thus half of the regular army was composed of men who had served less than six years, only a fourth of the men being "old soldiers" of ten years' standing. This leaven of veterans, on which the discipline and solidity of a corps depended, is not conspicuous by its presence in the army of to-day. The sickness in India was ordinarily double that of the sickness at home. The troops of the line in Bengal numbering 16,580 sent 172,388 cases to hospital in the five years 1850-54, when 4,461 ended fatally. At Peshawar during the same period there were 3,635 admissions annually to 1000 men. The admissions into hospital in 1893 were 1,415 per 1,000 a wonderful improvement on 40 years ago. With regard to losses in war, though the mortality frequently exceeded 10 per cent., it was disease and not "villainous saltpetre" that killed the British soldiers. For out of 9,467 men dying among regiments in India prior to the Mutiny or sent out in 1857-58, only 586 were killed in action or died of wounds. How could it be otherwise, seeing the way the men were fed and the official recognition of drink? Salt provisions were a common ration, and hard drinking was the rule. The following occurs in the Wellington Despatches, dated from Poona in May, 1803: "Urge the gentlemen there to send forward 3,000 or 4,000 gallons of arrack. Salt provision will also be much required, as the Bombay sheep contractor had failed entirely." The report of the Commissioners pointedly states that "the diminution in the mortality of wars before the Mutiny was due to improvements in the sanitary arrangements." With regard to the return "constantly sick," 100 per 1,000 was reported to be the normal state in India. In Bengal the average constantly sick was 84 per 1,000. The reporters thus put the case graphically: "1,000 men are at a station; 84 of their number are sick in hosptal, where 69 die annually. With this amount of sickness, an army of 70,000 British troops (which is the strength in 1893) has, so to speak, a vast hospital of 5,880 beds constantly full of sick, and loses yearly by death 4,830 men or nearly five regiments." At present our ineffectives "constantly sick" from venereal disease alone nearly amount to the strength of three regiments. The last death-rate, 1893, being 12·6, shows that whereas five men died in the fifties, less than one dies to-day. With regard to the mortality among the British officers ot the Company, their establishment for the 20 years 1814-33 amounted to 4,219, and the deaths numbered 3,194. The annual mortality was thus 38 per 1,000. The officers of Royal Army were 1,079. The deaths among the officers of both armies put together was 197. Of men of their ages in England about 53 die annually: "Consequently 144 officers died every year in India in excess of the natural deaths. In the twenty years the deaths at the English rate would have amounted to 1,060; and as 3,936 officers died, the excess by violent and unnatural causes was 2,876. Of this number 122 were killed in the field or died of wounds; consequently, while the dangers to which they were exposed on the field of battle was fatal to 122 officers, the dangers from disease were fatal to more than twenty times that number!" When taking the general death-rate of the army at 69, the case is really somewhat understated, because during the twenty years 1814-33, when the mortality among officers was 38, the figures must be inverted for non-commissioned officers and men, whose mortality was 83 per 1,000. It is worth noting that the mortality in the Civil Servive at the same period was under 2 per cent. for the first twenty years' residence in India.—*Times of India.*

TEMPORARY SHELTER ON ACTIVE SERVICE FOR NATIVE TROOPS.

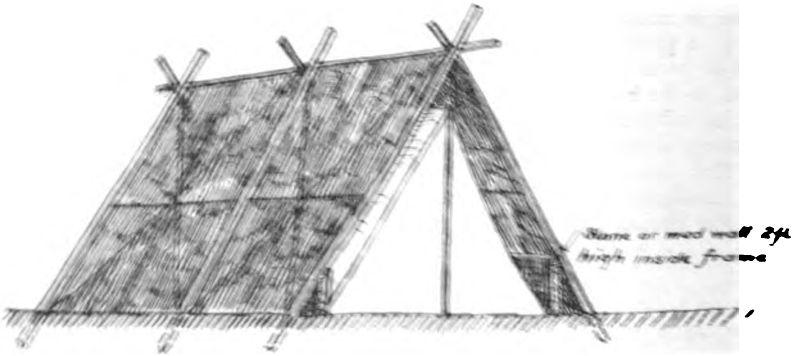
Ex. I.

Rough Sketch of a Frame.



Ex. II.

Rough Sketch of Frames fixed over Sepoys' Tent.



OCCASIONAL NOTES.

NOTES ON TEMPORARY SHELTERS FOR NATIVE TROOPS.

By Major A. W. T. Radcliffe, 14th Sikhs.

(ILLUSTRATED)

While lately in command of a wing of my regiment stationed in Waziristan, I was ordered to provide temporary shelter for my men, who were accommodated with the usual Sepoy Pals.

Being limited as to expenditure, I was obliged to abandon the idea of building regular huts, and consequently decided to utilize the tents as they stood. To make the tents quite waterproof and warm, I decided to improvise coverings make of the long dry grass which was plentiful in the vicinity of the camp. The following is a description of the method adopted for the construction of these temporary shelters.

For each tent, a frame werk was made as shewn in fig. 1. This frame work consisted of 7 *ballies* or sticks of the same description as those used for telegraph poles on service. These *ballies* can be bought for about 8 annas each from the villages. The poles should be about 15 feet long, and arranged three on either side, with a cross pole. Each frame should be made with long dry grass, placed at right angles to the ground, in layers about 6 inches thick, with the grass laid on in the same way as the slates on the roof of a house. The poles should be tied together with string, and when ready should be interlocked over the tent on to the cross pole, the whole being securely lashed. Care should be taken to prevent the frames resting on the tent, and about a foot should remain between the frames and the tent itself. One end of the tent, the one most exposed to the wind, should be permanently closed up with either a stone or mud wall; a mud or stone wall should then be built up on either side of the tent, but *inside* the frames. The poles should be firmly placed in the ground and made perfectly secure (see fig. 2). A shelter of this kind can be erected at the expenditure of about Rs. 3-8 for each tent. If funds are available, matting or *chatai* can be added to the frames, and should be placed underneath the grass. The matting will make the roof further waterproof, but it is not absolutely necessary as the grass roofs answer the purpose sufficiently well.

The above method has been found to give excellent shelter at a very small cost, but no doubt many better methods will suggest themselves to readers of the Journal.

France.—The French mountain artillerymen are a fine body physically, being mountaineers selected with great care. Their dress and that of the officers, their camp, the mules, forage, and stable management, saddlery, gun park and ammunition are described. The mules are very strong, and average in height 15 hands, with proportionate girth measurement; their price varies from £35 to £40; the officers' and mounted men's cobs are most serviceable chargers for mountainous warfare. The rations are good and plentiful; the mules are clipped, and shod, but badly groomed. The gun is a 12-pounder B. L., weight 220lbs.; ammunition, shrapnel or melinite shell. Draught is only resorted to as a relief when marching on the high roads. Fire discipline is not so thorough as in our service; 14 rounds per gun only are carried with the "fighting line," as against our 32 rounds per gun.

Italy.—The physique of the Italian mountain gunners is very fine; they average 5 feet 9 inches in height, and are powerfully built. The mules are of an extremely fine stamp and over 15 hands. The gun is a 7-c.m. (2¾ inch) bronze B. L.,; weight 214lbs.; average weight carried per mule, 340lbs. Shrapnel is used, with percussion fuze for ranging and time fuze for subsequent effect. In the "fight line" 14 common, 56 shrapnel. and 4 case shot are carried per sub-division. The result of practice showed a want of fire discipline, and on many points the batteries do not compare favourably with our own.

THE NEW "BRANCARD" WHEELED TRANSPORT FOR THE CONVEYANCE OF SICK, WOUNDED, AND AMMUNITION IN THE BELGIAN ARMY.

Each company of the Field Army has now been provided with one of these. In the estimation of the writer the arrangement supersedes all others that have appeared up to date.

It is an invention of Herr C. de Mooy, Staff Medical Officer of the Belgian Army. He has attempted to avoid, as far as possible, all violent horizontal or vertical movement in the transport of sick and wounded, and has also had in view the diminution of draught power and time, thus saving in *personnel* and money to the utmost extent. There can be no doubt that the experiments have been attended with brilliant success.

The "Brancard" is in two parts, the "Brancard" proper which will carry one or two men, and a wheeled frame on which the "Brancard" is placed.

The frame consists of two very high wheels joined by an axle bent up in the centre, and on which there are round iron springs 7½ feet long.

By pushing or sliding the springs backwards or forwards into boxes, the weight of the "Brancard" can be so adjusted as to remain permanently balanced. By an arrangement of chains one man can easily fit the "Brancard" on to the frame, and a total weight of 20 kg. (450 lbs. about) can be pushed along a level road by a child.

During a 5 hours' march one man was able to push the cart without any difficulty with a load of 20 kg. of ammunition (about 500 lbs.). Herr de Mooy intends to adapt this cart for the transport of ammunition, rations, and stores, etc., several experiments having been made with the best results during the autumn manœuvres with a special ammunition cart constructed on this principle.

Experiments made in the transport of sick showed that a soldier who had travelled for 1½ hours in the "Brancard" had fallen fast asleep and had to be shaken to be awakened. A medical officer was able to write with perfect ease during the movement of the cart.

The "Brancard" is further provided with a hood as protection against rain, wind, and sun, which also makes a tent for one man. It is also fitted with a sheet iron box for dressings bandages, etc., and there is ample room for clothes, food and drink in pockets.

The whole thing is so simple and practical, that a soldier can learn to use it at once. Indeed space fails to describe all its advantages, and there is no doubt that it will soon become known far and wide.—*Militär Wochenblatt.*

THE CROSSING OF RIVERS BY CAVALRY.

The *Times* recently published a series of important articles on the Hungarian Cavalry from the pen of a military correspodent. The last of the articles issued dealt principally with the best means of setting Cavalry across rivers, and contained the following account of a series of experiments made in all possible methods of crossing rivers in the absence of permanent passages :—

"The force of Hungarian Cavalry carrying out the experiments, operated," writes the correspondent, "under a given tactical idea, finally reach the river Theiss, and wishing to push the reconnaissance beyond, the advanced squadrons proceeded to attempt to effect a crossing at three places, with a view to deceiving the enemy as to the real point of passage, which was Zenta, where the river—over 300 yards wide—gave full scope for a thorough trial of the appliances and methods under examination. The first duty devolved upon the pioneer troop, twenty-five strong which accompained the advanced squadron in its reconnaissance to this point, and with which moved, also, a light country cart containing all the neccessary materials for the construction of a wooden-framed canvas-covered boat. The party quickly laid out on the shelving bank the poles forming the bottom of the frame, lashed them together, and fixed twelve uprights, about 2½ feet long, at intervals round the outer poles, with ropes interlaced between, thus making a strong though light network, outside which was stretched a waterproof canvas, passing over the tops of the uprights and rope lacing, and fastened to the bottom of the frame, inside, at intervals by means of ropes. Nine of the uprights were in this particular case formed by the pioneer hatchets, an invention of the smart lieutenant in command of the 15th Hungarian Hussars regimental pioneers, who thus demonstrated another use to which this part of the equipment could be put, and who proved his ability and resource in more ways than one during these operations. Within forty minutes the canvas boat, capable of crossing twelve men with saddlery, arms, and accoutrements, at one time, was complete, made by five men who carried it to the water's edge and launched it. The work had been performed in a leisurely manner, showing that, if hard pressed, the party could have completed it in five-and-twenty minutes, or, with practice, even in less. Meantime no one had been idle. The other pioneers had removed the saddles, under cover of a belt of trees on the bank, some had stripped themselves, while others were probing with sticks to find a sound point at which to start the horses into the water."

"The squadron, hidden away behind trees higher up, was similarly employed or occupied inflating air-tight bags and filling waterproof sacks with straw, hay, or dried leaves. Within a few minutes of arrival a couple of men stripped, and with inflated bladders tied at the back of the armpits, were sent swimming across to make soundings on the opposite bank for a landing-place for horses and boats. There were now some half-dozen sack and bag rafts afloat ready to assist the canvas boat in conveying across the saddlery and arms. Each carried some eight men and saddles every journey. They are of two kinds, as stated—viz, waterproof air-tight inflated, and waterproof filled with something light, such as straw or hay. The waterproof filled sacks are an old pattern. They are fastened, nine together, with rope, resting between two frames of planks. These rafts are slow and clumsy compared to the newly-invented inflated air-tight-bag rafts, which are formed by tying nine bags together, resting on a single frame work of planks, and which move very handily and swiftly through the water. Both kinds, as well as the canvas boat, are propelled by wooden hand paddles, the pioneer spades and shovels being also used for this purpose by the men of the troop. The air-tight bag, some 5 feet long by 3 feet broad and pointed towards the ends, is made of brown canvas, with a mouth-piece at one end for inflation, weighs under two pounds, and takes only a few minutes to inflate with the mouth. Fifty bags are carried per regiment, folded over the cloak at the back of the saddle."

"The average time occupied in the double journey across and back was twenty minutes, and at each trip the rafts and boat left their contingents of men and saddlery on the other bank, the former taking up a defensive position to cover the crossing of the horses with carbine fire in case of surprise. The passage of the horses was carried out in different ways. A couple of men, stripped, with bladders or air-belts fastened under their arms and riding the leading horses, entered the water, urging their mounts with voice and leg until these lost the bottom and started to swim. Meantime the remaining horses of the troop had been led to the water, all four reins knotted on the neck, and as soon as the leading riders had gained a few yards' start the men of the troop, forming a semi-circle in rear of the horses, began to shout, crack whips, and splash, thus driving them into the water, after the leaders, in a drove. In some cases all crossed when once started, but in others a few turned back and refused obstinately to face the water again. These were at once taken to the rafts and, held by the men by the bridoon reins, were driven into deep water and thus towed across."

"Another method, adopted in a few instances, was for the horses of each troop—twenty-five in number—to be driven into the water behind rafts with horses held swimming alongside, which thus gave a lead across. Again the men, having stripped, rode their horses across from bank to bank, but this plan was not much resorted to."

"No horses were swum with saddlery on and men riding."

"The squadron and Pioneer troop crossed the Theiss, resaddled, and moved off within two and a half hours of first reaching the bank, including the time taken in constructing rafts and boats. The following morning, more preparations having been made and two large barges secured, four portable collapsible boats and two corrugated iron pontoons, the compartments of which are separable for transport purpose, were brought up on light waggons which are attached to limbers drawn by four horses, and were formed into rafts, upon which the twelve Horse Artillery guns and limbers of the two batteries attached to the Cavalry Brigade were taken across, while the brigade horses, men, saddlery, and equipment were passed over in the manner already described for the squadron on the previous day. The operation was most successfully carried out in the presence of the Emperor and the Army Staff. It occupied about four and a half hours, during which twelve guns and limbers and more than 2,003 horses and men were transported across this broad river and formed up on the other side. The only articles made use of which did not accompany the troops were the two large barges employed on the second day. The horses of the Artillery teams, being accustomed to each other's company, swam over together in most cases very readily. In respect of the banks being gradually sloping the point of passage was favourable, but a sandbank, a few yards after the horses had reached deep water, disconcerted them very much, as they had to plunge for a second time into deep water after touching bottom. The water, also, being very deep in midstream, was extremely cold and very uninviting to horses which had been working or standing under an almost tropical sun for some time previously."

PASSAGE OF DEFILES BY NAPOLEON'S INFANTRY.

The following anecdotes of the powers of marching of Napoleon's troops appeared in the *Militär Wochenblatt* of 9th November, 1895, in an article on "Small marching columns on separate roads *versus* march formations on broad fronts"; they are probably new to English readers, and may repay translation as giving a vivid idea of the energy with which Napoleon was able to inspire his men.

After noticing that the French habitually marched with the artillery on the road, and the infantry on the fields on each side in order to reduce the length of their columns, the writer gives the following account by an eye witness, the Saxon Lieut.-Colonel Aster, of the march of the French army from Silesia to Dresden, 1813.

In under four days the French army of 100,000 men marched nearly 120 miles on one road; in places where the road and ground permitted it, columns of all arms moved alongside each other, all hurrying to their appointed goal. The cavalry and artillery were placed by preference on the road; the infantry marched alongside them and clambered over every obstacle they found in their way, even walls. The army passed the "White Stag" on the Bautzen road in this manner; but as it here reached Mord Valley bridge, the infantry, to continue its march, had to cross over to the other side of the road. In order not to stop the march of the cavalry and artillery, the infantry climbed down the lefthand slope of the valley close to the bridge, crossed underneath it, and then clambered up the right-hand side again. By their inexhaustible energy they achieved their object—the unhindered continuation of their march.

Their marching into Dresden, on the 26th August, was equally remarkable; as the troops passed the Schwarz Gate, no tactical order could be recognized. The artillery trotted in the middle of the road close alongside it, and often mixed up with it, pressed the infantry and cavalry, and in this way they passed the narrow entrance. The infantry doubled most of the time and, shouted *Vive l'Empereur*, although the Emperor was not present. As soon as they had passed the gate, and the leaders of the hitherto mixed up and irrecognizable units arrived at open space, they halted, and the rest of the company or battalion assembled as quick as lightning, fell in at once, and doubled off without further halt to the Elbe bridge, which they had to cross.

THE LEE-METFORD RIFLE.

With a view of ascertaining the penetrating power of the Lee-Metford rifle and cordite ammunition with greater preciseness than was previously known, an elaborate series of experiments has just been concluded at the Royal Military College. The experiments were conducted on two days. Eighteen different targets were used, and the results are of a most interesting character. Fired at a wicker gabion filled with wet sand, on both days the bullet went clean through and was lost. The next target was a solid wall of sandbags. On the first day the bullet penetrated 28 in., and then lodged. On the second day the penetration was 30in. It is curious to observe that the path of these bullets was never straight. In the 30 in. penetration the bullet went straight for 20 in., then turned at right angles for 8 in., and afterwards, again at right angles, in the direction of the firing point, where it was found undeformed. A target of loose sand was then tried. On the first day the bullet passed through 3 ft., and was then lost. On the second the target was deepened by a foot, and on this occasion also the bullet passed through and was not afterwards seen, thus giving an inconclusive result. A mound of loose shingle of 1½ in. gauge proved a most formidable objective. On the first day a 4 in. special bullet was used, and this was found broken into shavings. On the second a 6 in. bullet was used and broken up fine by the impact. A severe test was one against a matchboard wall, the sides of which were 3 in. apart and filled with shingle varying from ½ in. to 1½ in. gauge. In the first experiment the bullet just got through, and in the second it went right through. In a similar experiment to the last, but with the sides of the wall 4½ in. apart, on the first trial the bullet failed to penetrate, but on the second occasion it lodged in the back board, just starting it. The next experiment was against a matchboard wall with sides apart as in the last, but filled entirely with shingle of ½ in. gauge, and on both days the bullet passed through. In a subsequent trial with a 6 in. matchboard wall, filled with shingle of ½ in. gauge, on the first day the bullet failed to get through, but on the second it lodged in the back board. Against a matchboard wall, the sides of which were 4½ in. apart, and filled with shingle of 1½ in. gauge, on the first occasion the bullet just failed to get get through, but on the second the penetration was complete. With walls 6 in. apart and shingle of similar gauge to the last, the bullet failed to go through on both occasions, but on the last it penetrated 5 in. Shooting at fir-tree logs on one day 27 in. thick, and on the next 37 in., the bullet passed through and was lost in both instances. Oaken logs proved less vulnerable. In the first experiment the bullet passed through 16 in. and was lost. In the second, however, the target consisted of two trees, each 12 in. in diameter, placed one behind the other. The bullet penetrated 20 in., going straight through the centre of the first, and on entering the second turned sharply to the right at about an angle of 120 deg., traversing another 8 in. of oak, where it was found undeformed. Firing against a stockade of 56 lb. steel rails on both days it was found that the section of rail against which the bullet impinged was dented. Some extremely interesting data accrued from the experiment against brick walls. On the first day the objective in each case was composed of soft brick, and on the second of hard, built up in various formations and thicknesses. To take the soft brick wall first. Against a 14 in. wall-stretcher brick the bullet penetrated 3½ in.; against a wall of similar thickness header-brick the penetration was 5 in.; against a 9 in. wall stretcher-brick the penetration was 4 in., and against a wall of the same thickness header-brick it was 5 in. Against hard brick, laid as the soft kinds were, the penetration was, in the case of the thicker wall 3 in. and 3¾ in. respectively, and in that of the thinner walls the penetration was exactly as against the former. Fired against a ½ in. steel plate the bullet punched a clean hole on both days. In the experiments against the brick walls the range was 12 yards, in the remainder it was 20 yards.—*Army and Navy Gazette.*

A USEFUL FIELD INSTRUMENT.

Lieutenant-Colonel P. Neville, 14th Bengal Lancers, contributed to the December number of the Journal of the Royal United Service Institution a paper on the Delineascope. This instrument, he says, is designed amongst other uses, to assist the Military Surveyor by enabling him to construct maps from landscape sketches; it greatly simplifies and expedites triangulation, end saves much time in plotting. It is very portable, may easily be carried by a mounted officer, who must, however, dismount to use it. The instrument consists of a small camera, having a lens with a fixed focus on a tripod stand. The lens is directed downwards, and carries beneath it a mirror inclined to the axis of the lens at an angle of 45°. This throws a true picture of the landscape on to a piece of tracing paper secured by a frame on a horizontal object-glass. In this picture the right and left are transposed. By means of a focussing cloth the picture is transferred to the paper with a pencil. The paper is then taken out and reversed over a graticule on a white card, which divides into large and small squares, and then copied into a sketch-book ruled in similar squares. The graticule is made of a size to embrace exactly 30° of horizon, and two such sketches fill one page of the sketch-book. After transfer to the sketch-book the landscape is finished by eye, according to the ability of the draughtsman, but a very simple outline sketch is all that is necessary. There is a margin to every sketch in which to note all particulars regarding the ground, slopes of hills, height and thickness of walls, depth and current of streams, &c.; the back of each sketch is also available for further notes if desired. On the completion of sketch it is only necessary to take with a prismatic compass the bearing of any perpendicular line—say the centre line—and by means of a simple scale of half-degrees on a card, the bearing of every point in the sketch may be ascertained. This will be found an immense saving of time, and, moreover, has this advantage, that the map can be made from the sketches after the return of the surveyor to camp or quarters—a very important point for a hasty reconnaissance. The instrument can be worked entirely by one person, and all that is required is an orderly to hold the surveyor's horse while he draws. The sketches may be made very rapidly, and, after a trial or two, the primary inconvenience of drawing under a focussing cloth is hardly felt. The camera folds flat, and is carried in a leather case by a shoulder strap. The lens, and mirror chamber is carried in a case resembling that of a binocular, but smaller; and the tripod, which can be made of a folding pattern can conveniently be carried in a carbine bucket.—*Civil and Military Gazette.*

USE OF THE TELEPHONE IN WAR.

An interesting experiment of installing a telephone by trotting cavalry was recently successfully undertaken by some Prussian Uhlans between Berlin and Potsdam. Two sets of officers proceeded from Berlin to Potsdam. Each set was equipped with a complete telephone apparatus, which, together with the requisite quantity of thin wire, was carried by one of the men in a leather case on his chest. The end of the wire was, by means of a fork fixed at the end of a lance, thrown over the tops of the trees along the road. As each kilomètre of wire was thus suspended, a halt was made to ascertain whether there was connection with the station. A new kilomètre of wire was then connected with the former, and the march resumed. The two sets met at Teltow, where the wires having been tested, were connected, and telephonic connection between Berlin and Potsdam was established. The distance is about tweuty miles, and the whole task was completed in about four hours.

REVIEWS OF RECENT BOOKS.

"CAVALRY"

By General SIR EVELYN WOOD,

London ; Sampson Low, & Co.

Sir Evelyn Wood's *Cavalry in the Waterloo Campaign*, containing his articles contributed to the *Pall Mall Magazine* cast in a larger shape, is a remarkable evidence of the "cavalry revival." Those who now hold that modern weapons have swept cavalry from the battlefield are probably few, and, as Sir Evelyn shows, the value of the mounted arm has gained still greater recognition on the Continent. He holds the continental view rather than that of the diminishing number of his comrades who have no faith in cavalry, on the ground that rifle practice is executed in peace and war under conditions so materially different, as to furnish unreliable data on which to base deductions of any value, and also because the moral element remains the same. It might have been thought that nothing new could be added to our knowledge of the Waterloo campaign, but we have not lately read a more interesting military essay than that which Sir Evelyn has devoted to a delineation of the achievements of the cavalry. Wellington seems to have undervalued the mounted arm, and hence perhaps its services in 1815 have not been fully appreciated. Except for Sir Hussey Vivian, no writer has hitherto done full justice to it. Yet no achievement could have been more splendid in its results than the charge of the Household and Union brigades, which wrecked d'Erlon's infantry corps so completely, with some of its artillery, that the infantry were unable to advance again until late in the day, and then with much reduced vigour. It is true that the Frenchmen were distinctly inferior to the splendid forces Napoleon had commanded in former wars, and were besides grouped in dense, unwieldy masses, which placed them at a serious disadvantage; but, nevertheless, the triumphant course of the British cavalry was a splendid illustration of the value of well-trained cavalrymen boldly led. There was want of battle discipline among the rank and file, but this is partly explained by the lack of definite orders and of proper support, which resulted so disastrously for the brave cavalrymen. Lord Uxbridge, in undertaking a brigadier-general's duties made a mistake for which " there was absolutely no excuse." As to the French cavalry, says Sir Evelyn, they failed to break our ranks owing to want legal recognition of obvious facts. Some of Mr. Forbes's experiences are calculated to chill the enthusiasm of war correspondents in embryo who misdoubt their powers of physical endurance. Starting at five o'clock in the morning from Deligrad to telegraph news of the Servian defeat, he had to cover 120 miles before reaching the telegraph office at Semlin. He changed his sorry nags every fifteen miles, and arrived at Belgrade at nine next morning "sore from head to foot." Arrived at Semlin, he indited his despatch for hours without pause, and having placed it on the wires, slept for twenty hours in his clothes without waking once. Thus he had witnessed a battle that "lasted six hours, ridden 120 miles and written to the Daily News a telegraphic message four columns long—all in the space of thirty hours." All who know the quality of the despatch can fully appreciate the combined mental and physical strain. Nor were the perils of his calling limited to the perpetual dangers of the field, for whilst the bullets of Versaillists and Communards were flying in his front, flank, and rear, he found himself suddenly in the grip of the former, and was stuck up against a church wall to be unceremoniously shot as an insurgent, when the absence of gunpowder stains on his thumbs and forefingers attested his innocence and saved his life. Mr. Forbes does not shrink from some very pungent criticisms of the German "Staff History" and Moltke's estimate of the French strength in the battles of St. Privat-Gravelotte and Mars la-Tour. His arguments appear to us forcible and convincing: and indeed, knowing the utterly overwhelming superiority of the Germans throughout the war in men and material, and Moltke's genius for concentration, it was hard to believe that in those momentous struggles the preponderance was not largely on the German side. He brings out clearly in his own trenchant vigorous style the immense advantages of the Germans in every phase of the war, and he discusses in minute detail the events of the surrender at Sedan, illuminated by touches all his own which shed the halo of romance around scenes of gloomy tragedy. Of the historical account of the capitulation of Metz which appeared in the Daily News the morning but one after the event, and which was erroneously attributed to his graphic pen, he traces the source of inspiration and chivalrously rescues the name of the author from undeserved oblivion. On the subject of the wounded in future wars, Mr. Forbes has some disquieting reflections to offer which his vast experience invests with unchallengeable authority. The conclusion is that the altered condition of military armaments will bring about such an immense increase in the number of wounded that means must fail to supply their wants, and he quotes the words of Bardeleben that as bearers have to go into the fire-line an augmentation of their number means simply an increase in the number of wounded. He goes so far as to assert by way of counterpoise that the prompt removal of the severely wounded is not an unmixed good, and with a dash of the Philistinism at which he scoffs, he deplores the deterioration which is produced in the British soldier by what he terms "coddling." The assuagement of pain by anæsthetics seems to us, on the other hand, a principle of humanity, and we do not believe in the hardening of soldiers by inflicting needless torture upon them. The cases of endurance which Mr. Forbes is able to cite simply prove what man can suffer, but they do not prove that the mitigation of suffering tends to impair valour and constancy.

HISTORY OF THE ORGANISATION, EQUIPMENT, AND WAR SERVICES OF THE REGIMENT OF BENGAL ARTILLERY.

By Francis W. STUBBS, Major-General, Retired List of the Royal
(late Bengal) Artillery. Vol. 3.
(London: W. H. Allen & Co.)

In this, the concluding volume, General Stubbs brings down the history of the distinguished corps to which he belonged to its final extinction by amalgamation with the Royal Artillery. The third volume now before us, deals with an eventful period of a little over twenty years, viz., from 1838 to 1859, comprising the Afghan Wars, 1838-42; the Gwalior Campaign; the first and second Sikh Wars; the Second Burmese War; and the suppression of the Indian Rebellion—wrongly called Mutiny. The text is copiously illustrated by maps, diagrams, and portraits. Very conscientiously and carefully is this book written, but we cannot help regretting that there is not in it more of anecdote, more of matters of human interest, than General Stubbs has given us; still the record is reliable, and there are some interesting personal details. Very gallantly and devotedly did the Bengal artillerymen bear themselves when shut up in cantonments at Cabul and during the subsequent retreat. The regiment was represented on these occasions by the 1st Troop, 1st Brigade, H. A. and the Mountain Train. In the report of Lieutenant Vincent (afterwards Sir Vincent) Eyre occurs the following testimony to the conduct of the H. A.: "On the retreat of the Army from Cabul, owing to the starved condition of the horses, which disabled them from pulling the guns through the deep snow and rugged mountain passes, the guns were one by one spiked and abandoned. In the Khoord Cabul Pass a whole gun's crew perished rather than desert their charge, and on nearing Jugdulluck, some horse artillerymen, headed by Captain Nicholl, acting as dragoons, charged and routed a party of the enemy's cavalry. They died like true soldiers, selling their lives dearly. Only three men escaped with life, being taken prisoners. Two others who were left behind with the detachment of wounded at Cabul also survived." In the first Sikh War the artillery fully maintained their reputation. They fired away on the first day of Ferozeshah nearly all their ammunition, there being left little even in the spare waggons and no reserve on the field. One half battery was only too glad to obtain fifty rounds from some captured Sikh waggons. In the second Sikh War the artillery were numerous and freely used especially at Goojerat, which was won mainly by the fire of our eighty-eight guns which made the Sikhs say "they were in hell." During the Mutiny all branches of the army fought magnificently, but none

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MOUNTED INFANTRY.

By Major R. M. Rainey, 12th Regiment (2nd Burma Bn.), M.I.

The duties of Mounted Infantry and the circumstances which would require it to be called into existence, are laid down in the Regulations and Field Service Manual for that arm. A few extracts from these regulations will briefly explain what these duties are, and the principles to be kept in view.

"Mounted Infantry are usually called into existence in order to provide picked infantry soldiers capable of acting with the Cavalry, and of using their rifles and bayonets to the greatest advantage when great rapidity of movement is requisite. With this object in view, Mounted Infantry must be provided with animals suited to the country in which their services are to be utilized."

"Mounted Infantry, on account of the varied character of the warfare in which British troops are often engaged, as well as from the comparatively small number of our regular Cavalry, may be required at any moment to act alone in the absence of Cavalry. It is therefore necessary to give Mounted Infantrymen a knowledge of reconnoitring, vedette, and outpost duty, flanking patrols, also advanced and rear guards."

"The Company should be considered the tactical and administrative unit."

"It cannot be too frequently impressed upon all ranks that they are in no sense Cavalry. They are only intended to fight on foot, their horses and ponies being provided to enable them to make long and more rapid movements than the ordinary infantry soldier could effect. As a general rule they will act in company with Cavalry, whose duty it will be to engage any large bodies of the enemy's Cavalry that threaten them in the open. Commanders of Mounted Infantry will remember that, when the assistance of Cavalry cannot be depended upon, their best security is to be found by keeping in any broken, intersected, woody, or marshy ground, where they will have a great advantage over regular Cavalry."

"The branch of the service against which Mounted Infantry are likely frequently to find themselves pitted in patrolling and detached duties generally, is the Cavalry.

Unless in a very open country, with great inferiority of numbers, Mounted Infantry, well handled, if proper precautions are taken and proper tactics pursued, have nothing to fear from Cavalry."

"Mounted Infantry must never allow themselves to be taken by surprise by Cavalry, so as to give Cavalry a chance of charging them mounted. If an attack is pending, Mounted Infantry must, if possible, gallop to cover or enclosed and broken ground, and thence repel it and retaliate."

The Infantry Drill also touches on the employment of Mounted Infantry: thus in Part VI it is laid down that, "when Mounted Infantry is attached to an advanced guard, it will be most profitably used in moving rapidly to seize or hold special points, such as bridges, defiles, etc. Mounted Infantry may also be usefully employed in support of the reconnoitring Cavalry, by holding points on which the Cavalry may have to fall back, or otherwise helping to cover its retreat": again in Part VIII, Operations by Night, we find that Mounted Infantry "will be kept entirely separate," with the Cavalry and Artillery until day break. "Then, if the attack has succeeded, they will push forward with all speed, endeavouring to get round the flanks of the retreating enemy. If the attack has failed, they will do their utmost to protect the retreating Infantry by falling on the flank of the pursuing enemy."

The above extracts show very clearly the nature of the work that Mounted Infantry are expected to be able to perform. Numerous other situations suggest themselves where Mounted Infantry might be profitably employed; for instance, in the case of Horse Artillery with Cavalry, a detachment of Mounted Infantry would be invaluable, relieving the Cavalry of all anxiety for the protection of the guns and ammunition column, and thus releasing many extra men of the Cavalry for the actual charge, besides supplementing the fire of the guns during the action, and, together with them, covering a retreat of the Cavalry should the charge fail. In this latter case the presence of a detachment of Mounted Infantry might entirely alter the condition of affairs and would certainly greatly facilitate saving the guns. Their duty would be to protect the guns, especially on the flanks, to the last, should they (the guns) have received no orders or be unable to retire; while should the guns be ordered to retire, the withdrawal would be covered by the Mounted Infantry who should, if necessary, sacrifice themselves for this purpose.

As it is with Cavalry and Artillery that Mounted Infantry will be required to cooperate, it seems a pity that the drill books of those branches do not lay down any principles regarding the employment of Mounted Infantry when acting with them.

To enable Mounted Infantry to perform the duties expected of them, it is obvious that they must be fair horsemen; thoroughly trained in reconnoitring and scouting, and well mounted. Should they, through being indifferent riders, or badly mounted, be unable to keep up with Cavalry or Artillery, they cannot perform their duties; while ignorance in reconnoitring and scouting might lead to their own destruction if acting alone.

When employing Mounted Infantry it would be advisable to pause to consider whether, taking into consideration their means of locomotion and their training, they are capable of performing the work required of them.

The fear that Mounted Infantry would ape Cavalry and eventually become an inferior substitute for that arm, has perhaps caused some writers on the subject to undervalue the importance of giving Mounted Infantry really good mounts. Mules, cast horses, donkeys, indeed anything, have been sometimes advocated for this purpose. Mounted Infantry they would be, in one sense of the word, and even thus mounted they could perform some duties, but they could not "act in company with Cavalry " or " act alone in the absence of Cavalry," while should they find themselves pitted against Cavalry alone, and in at all open country, they would run every chance of being annihilated.

The same fear has perhaps caused the importance of Mounted Infantry being good riders to be overlooked. Of course, on the grounds of expense, it would be impossible to horse Mounted Infantry as well as Cavalry ; but, remembering that they have no " shock tactics" when mounted, I will endeavour, further on, to show that, without poaching on the remount preserves of Cavalry, any number of suitable mounts could be obtained on the spur of the moment, in the event of even a large force of Mounted Infantry being organised, or an existing nucleus being augmented, in the case of war either at home or in India.

The absurdity of expecting badly mounted and insufficiently trained Mounted Infantry to perform the part laid down for them in Regulations, was throughly brought home to me at field days at Bangalore in 1885. I was then in the 1st Madras Pioneers and was handed over 50 men and 50 transport mules, with makeshift kit in the form of transport saddles converted into riding saddles, to train as Mounted Infantry. After a short training, quite as long, however, as it would be possible to give men organized nowadays on the outbreak of war, we were detailed to take part in the brigade field days. The duty we were generally told off for was escort to the Horse Artillery (*E. B.* R., H. A., the distinguished Maiwand Battery). My men were all bad riders, the saddles were cruel things to sit on, and the mules, peculiarly "cussed" brutes, either would not or could not keep up with the Battery. Had it not been that several officers attending the garrison class going on at the time, volunteered (unofficially) their services as whippers-in to the Mounted Infantry, and armed with hunting crops flogged up the mules, the gallant Battery would frequently have gone on without its escort.

It was not only in pace that the mules failed but also in scouting. Not one mule would leave the others, consequently, on one occasion, when I was ordered by the Officer Commanding the Battery to quickly occupy a tope about 400 yards off on one flank of the guns which were coming into action, I was obliged to trot up towards it without scouting. As we approached to within about 200 yards, I was thinking it was time to dismount and advance on foot, though I had reason to believe that the tope was unoccupied as some Cavalry of our own side had moved round that way a few minutes before. However, my mule stopping suddenly, shot me over her head. At the same moment a squadron of the enemy's Cavalry galloped out of the tope through a gap at right angles to our advance. Looking round, I was astonished to see that a similar accident had occurred to the whole of [illegible] tranquilly [illegible] Cavalry [illegible] ordered [illegible] charge is [illegible] of [illegible] action [illegible] duties [illegible]

[illegible] that Mounted Infantry [illegible] with mere [illegible] provided they are not [illegible] make [illegible] some extent [illegible] Small men [illegible] horses or ponies [illegible] thousands of [illegible] a great war [illegible] our Mounted [illegible] would [illegible] that Mounted [illegible] consequently [illegible] except in [illegible] Mounted Infantry [illegible] ground [illegible] under all [illegible] proportion of [illegible] must also be [illegible] the duties and [illegible] Regulations.

[illegible] countries mounted [illegible] particular [illegible] Egypt and Burma [illegible] services [illegible] Mounted Infantry. In Burma there is a permanent establishment of Mounted Infantry [illegible] there are about 450. [illegible] the remainder are Native [illegible] Burmans [illegible] beasts [illegible] ground [illegible] different regiments. Re- [illegible] the case [illegible] Battalions [illegible] permanently. The [illegible] is very [illegible] Burma Battalions [illegible] excellent [illegible] Mounted Infantry [illegible] surpass the Mounted Infantry [illegible] service in [illegible] regular Mounted Infantry there is a consider- [illegible] mounted Military Police. Burma is a country where there [illegible] the conditions of service are peculiar. The Mounted Police were originally armed as ordinary infantry with rifle and bayonet. Experience proved that this armament was not altogether suitable to the [illegible] service in the jungles. It is quite the exception to find [illegible] in the open, and if he is surprised he won't stand to fight but will bolt for the nearest cover. Leaving out of the question the case of a stockade, pagoda, or such like positions in which the enemy would await an attack, and under which circumstances ponies would be left behind and an attack conducted on foot in the usual manner, I wish to point out that men armed with rifle and bayonet only, have very little chance of inflicting much damage on an enemy whose tactics are to lie in ambuscade, fire, and then bolt. I believe that most officers who have had experience with Mounted Infantry in Burma, will agree with me that the best chance of success is to ride down the enemy with lance, sword, or pistol. By the time Infantry armed with rifle and bayonet only, have dismounted and loaded, the dacoits have probably gained cover, or are too far off for a man shooting hurriedly to hit with any chance of certainty. It must be remembered that the enemy will scatter at once, and that the target will only be single men running and jinking among bushes. The men quickly found this out, and I know that they frequently rode dacoits down, knocked them over with the butts of their rifles, and then dismounted and shot or bayonetted them. Some men tried fixing bayonets and using the rifle as a lance, while others, riding with loaded rifles, shot their man at the muzzle of the rifle, without dismounting. The Military Police authorities soon recognised this and the Mounted Police were given carbines, swords, and lances. They have practically ceased to be Mounted Infantry, and are really Cavalry. What would appear to me to be the best all round arms for Mounted Infantry (in Burma only) is a rifle with cutlass that could be fixed as a bayonet or used as a sword. This would enable them to deal with men in the open or rideable jungle, while they would still be in a position to dismount and undertake the attack on a stockade etc., and carry home the assault with the bayonet. This is a suggestion to meet a special case. Under ordinary circumstances the rifle and bayonet are the only weapons a Mounted Infantry man should have. No temptation to fight on horse back should be given. Whatever bucket may be issued for the rifle should be such that whenever or however the man becomes separated from his horse, he should remain a fully armed and equipped Infantry soldier. The Cavalry carbine bucket would be quite unsuitable. The bucket issued to Mounted Infantry in Burma is a very good pattern. The butt of the rifle rests in it, being plunged in some six inches. The man then passes his right arm through the sling. A strap—a wallet strap answers the purpose—buckled on to the upper swivel so that the man can pass his arm through it as a lancer does with his lance, is a great improvement and relieves the soldier greatly.

Leading the four ponies of a section when the other three men have dismounted for dismounted duty is an impossibility in dense jungle, on a narrow foot path, and on mountain paths, if it is attempted according to regulations. To meet this difficulty I have used a simple little contrivance which enables No. 3 to lead the four ponies in single file as transport animals are led. A piece of wood the thickness of a man's fore-finger and three inches long, is tied on to the back of each saddle by a leather thong (a boot lace will do) tied round the centre of the bit of wood. Each man on dismounting passes his reins over his ponies head, slips them over this bit of wood on the saddle of the pony in front of him, and runs a leather ring or stop which must be sewn over the reins up to the bit of wood. This only occupies about the same time as handing over the ponies to No. 3 in the usual manner. No. 3 of each section must ride first when moving in single file, otherwise no alteration is necessary in the drill.

Mounted Infantry saddles, on the lines of a Cavalry saddle, should be light and strong, and of a size to suit the animals for which they are intended. A blanket can always be carried under the saddle. Mounted Infantry, as a rule, wear ordinary ammunition boots, often hobnailed; many men ride with their feet home in the stirrup irons which should on these accounts be unusually roomy. I have frequently seen men hung up when dismounting hurriedly and some times dragged, owing to the stirrup irons being too small. This is a point I do not think has ever been given sufficient consideration. As regards bits, a variety of these should be supplied. Mounted Infantry are as a rule hastily got together. The horses or ponies are not mouthed and broken as Cavalry horses are, and consequently it is unreasonable to suppose that one pattern of bit can be suitable to all kinds and conditions of mouths. If possible, bits with only one rein are preferable. A headstall and rope of the colonial pattern is the best. All picketting gear, grain, men's rations, &c., should be carried on pack animals. It may be taken for granted that the horses will be small, and if they are to keep up with Cavalry and Artillery they must never be overloaded. If the men are decent riders and are wanted to accompany Cavalry across country, they should have short spurs, otherwise they will be left behind when it comes to jumping.

For carrying ammunition the bandolier is the best arrangement. Extra rounds might be carried on the belt in the same way. More ammunition could be carried in the men's pockets, and in the holsters when going into action.

The clothing of Mounted Infantry is an important point. In Burma an excellent waterproof cape with hood is issued, which is invaluable in a wet country, and wears remarkably well. A serge, patrol-jacket-shaped coat is also issued, khaki cotton cord breeches, and a pair of canvas gaiters. The serge coats are useless, catching on every thorn bush and tearing. Stout khaki drill or cord, with horn buttons, would be much more serviceable. The buttons issued are small metal buttons covered with serge which frays at once. A loose comfortable Norfolk-jacket-shaped coat with a low collar and shoulder straps, would be most suitable. The cord breeches are good wearing material and if worn with putties instead of gaiters would be good enough. As it is, the clothing being made in sizes, the breeches generally fit very badly at the knee, and slip up and down causing chafes. The loose ill-fitting gaiters give no assistance to keep the breeches in place, and men when on column duty often tie putties on to keep the breeches down, and put their gaiters on over the putties. If gaiters are issued, brown leather would look much better than canvas, which, unless pipeclayed, and pipe clay is out of place with Mounted Infantry, always look dirty and untidy. Of course articles suitable to one country might be out of place in another, for instance, in Afghanistan, poshteens might be substituted for waterproof capes, and extra warm clothing would be required.

So far I have only touched on Mounted Infantry mounted on horses and ponies or mules.

The useful work done by the Camel Corps in Egypt is well known, and serves as an instance of how useful Mounted Infantry may be, even though their mounts do not admit of their moving at the full speed of Cavalry. Camels can only be used in certain countries and are suited to special cases only, while their great value as transport animals would render it unlikely that they should come into general use for Mounted Infantry. Elephants are most useful in heavy jungle intersected with creeks, such as some parts of Burma. Bicycles are only suited to countries with good roads where they can save a lot of wear and tear to horses. They have more scope in Europe than in the East.

Infantry carried on cars and waggons, &c., would be invaluable under many circumstances and there are few countries where they could not go. The idea is not original. Colonel Wilkinson Shaw in his book "The Elements of Modern Tactics" says, that he suggested such an arrangement twenty-six years ago, and he invites officers to work out the idea. He suggested using waggons made from Artillery waggons specially adapted to the purpose. He writes : "The frame of the car to be in two parts and similar to the body and limber of an ammunition waggon to enable it to go over rough ground." Seats were to be fixed to each part of the waggon, instead of the usual ammunition boxes.

Personally, I should be in favour of cars built on the above lines as regards facilitating crossing bad ground, but with seats for the men to face outwards as on an ordinary Irish car. Each car to be drawn by four horses, each horse carrying a man. The car could have a box seat for the Commander. The well would contain ammunition and a few necessaries, rations, &c. The cars should be low enough for a man to fire over standing. They could then be used with great effect formed in laager to resist Cavalry. Were the cars surprised and charged by Cavalry when on the move, or should they be cut off or surrounded, it might be possible to charge or break through, the men remaining on the cars with fixed bayonets and firing at the closest quarters. A revolver might be carried on the saddle of each of the car horses to be used by the men riding them in such emergencies. An echelon of cars would have the best chance of breaking through. Infantry mounted on cars would require some men mounted on horses or ponies to scout for them. In an emergency as suggested above these men might rally behind the cars and get through in their wake. Such Mounted Infantry could at all events go anywhere that Field Artillery can. Under the present system Mounted Infantry is hurriedly called together in the event of war. Drafts from different regiments probably at the best only very moderate riders, mounted on ponies &c. are hurriedly collected. The men can have little knowledge of the management and care of horses. Officers, men, and horses, are all strangers to each other; the drill and conditions of service being novel to all. It is a marvel that under such conditions Mounted Infantry have justified their existence. And yet, in spite of what appear insuperable obstacles, in spite of the disfavour that they are looked on in some quarters, in the face of the most unfavourable conditions, they have invariably rendered good service. If under such a system good results have been obtained, what an efficient corps might be brought into existence if organized and trained under more favourable conditions? It is true that in many regiments there are men who have undergone some training as Mounted Infantry, but even admitting this, the bulk of the men would be much as I have described above. I have seen the Mounted Infantry of a good many regiments, both British and Native, after two years in the Mounted Infantry of their respective regiments in Burma, whose best friends and most ardent admirers could not claim for them either that they were good riders or knowledgeable in the care and management of horses; and yet these men had undergone an unusually long period of training.

Economy is the great point in favour of such a system, while the dread of Mounted Infantry aping and eventually becoming inferior Cavalry, has perhaps something to do with continuing a system which can only produce imperfect Mounted Infantry.

Wars now a days may be expected to break out suddenly and to be terminated quickly. Under these circumstances it seems a trifle late in the day to commence organizing corps after war has broken out. It is generally admitted that there is a great field for the employment of Mounted Infantry, and there can be no doubt but that an Army which can have a highly efficient body of Infantry up with the Cavalry Division to support the Cavalry in the Cavalry duel, which, it is certain, will occur at the commencement of any great war, will derive a great advantage over its opponent The army whose Cavalry comes off victorious in this important preliminary conflict, will have reaped such valuable advantages that it seems folly to neglect any step that can facilitate the work of the Cavalry. Our Cavalry is second to none in quality, but is it, numerically, sufficiently strong to neglect assistance from the other arms? Unfortunately it is in the very first phase of war that such a grand field for the employment of Mounted Infantry exists, and it is during this all eventful crisis that, with our present system, Mounted Infantry is being organized. Under no circumstances can it be ready to take part in the first struggle for superiority. Is this true economy? If Mounted Infantry are, as the Regulations say, to operate with Cavalry, they should be as well trained, as well mounted, and as efficient in the work required of them as is Horse Artillery, whose special rôle is also to work with Cavalry. Without great expense a sufficient force of Mounted Infantry to fulfil these requirements could be easily organised. In India, as an experiment, a Native Mounted Infanty Corps of 800 men might be raised, small men equipped, clothed, and trained as Mounted Infantry, with 200 ponies as a permanent establishment to be made up to full strength by purchases on the outbreak of war, or when war was believed to be imminent. With this system all the men and Officers could be thoroughly trained in every branch of Mounted Infantry work. It would not be a medley of strangers thrown together, but a thoroughly efficient Corps under its own Officers. There would be sufficient horses or ponies thoroughly trained to do all the scouting and detached work, while the men, being efficient riders and accustomed to horses, would have little trouble with the new remounts received when ordered on service, and fewer sorebacks

&c., might be expected than occur now. I have already pointed out that there is every chance of a large number of suitable ponies being available. Or a Battalion might be formed of men partly mounted on cars. The Company is the tactical unit and would be uniformly mounted. For duties requiring especially good horses and riders, companies should be specially detailed. Men and horses having been drafted into certain companies for this purpose, the whole would be trained to ride, so that on the outbreak of war all the men could be mounted as ponies were bought; their places on the cars being taken by men volunteering from regiments, as is now done, to form Mounted Infantry.

It would be tedious here to compare the two systems, but I may note that some of the consequences of the adoption of the new system are that all the old English cuts are renumbered. None of the parries with the back of the sword are retained, though with the sabre these are some times very useful, as well as the "High Octave" of Hutton, (a parry, I may remark by the way, always used by native fencers of this country); no hitting and therefore no practice in parrying below the hip bone is permitted, and the normal guard is the old and tiresome hanging guard, instead of the "Half-Rest" of Hutton.

But what seems to me to call for most special remark in the book, is the omission to consider the use of the sword in war. The rest is amusement, this is business. Is it not a really serious omission? I think it will be seen to be so, if we briefly consider the subject here.

The question is, under what circumstances is the Infantry Officers' sword likely to be used in war? The answer divides itself into three heads.

Combats.

(*a*) With a savage armed with spear or sword with or without a shield.

(*b*) With a civilized horseman armed with sword or lance.

(*c*) With an Infantry soldier with the fixed bayonet.

There is also the possibility of meeting as opponent an Infantry officer armed with a sword. But compared with the other three, this may be allowed to be a remote contingency. There is not a hint, however, in the whole book, as to how these three attacks are to be met.

Now an officer does not so much himself attack as lead his men to the attack. In doing so however, he must defend his life as best he can.

Let us consider each case in turn.

(*a*) The civilized swordsmen of the present day, even when armed with a pointed sword, seldom or never uses the point. They cut, as far as I have learnt, generally from the right downwards to the left. Such a cut, or any other, should be easily warded, and the *riposte* would be, if he had to shield a thrust, probably a cut say at his arm or leg. And in this connection the warning of another swordsman should be remembered "Never forget that it is more easy to make sure of a cut than it is of a thrust in the heat of an encounter."

(*b*) A horseman's sweeping blow or steady lance thrust requires a strong guard or parry and a sword of not too light a make.

(*c*) In European warfare, in a hand to hand combat, by far the most likely case is that of a swordsman having to parry a bayonet thrust. By far the most likely and by far the most difficult! But in this book there is not a word about sabre against bayonet.

To parry this thrust, one way at least is to grasp the sabre with the left hand, and by a strong sideward or upward push of *both* hands, to throw the rifle off, just as is done in quarter staff play.

The new sword is not well adapted for any of these three things being in my opinion, too narrow, insufficiently sharp along the front edge, and unnecessarily sharpened along the back edge.

However, as some one has said, "It is not so much the lover that woos as the lover's way of wooing," so it is not so much the sword you use, as the swordman's skill in using it. Officers are themselves apt to pooh—pooh the use of the sword, and consider that a Napoleonic *coup d'œil* is the most precious possession on the field of battle. No doubt it is, and let us hope we all have it.

Yet the sword is not without its history even in modern war. It has not unfrequently been used in street fighting or isolated skirmishes.

Baron de Marbot relates in his Memoirs how he saved his life with it. He was trying to get unobserved through a village on foot, when he came suddenly on five Spanish carabineers. One took him by surprise and got a cut in over his left eye. He says "I ran mechanically towards the houses on my right, in order to get my back against a wall, but by good luck I found, two paces off, one of the steep and narrow lanes which went up to the vineyards." The soldier (a recruit he had with him) had already reached it. "I flew up there too, with the five carabineers after me; but at any rate they could not attack me all at once, for there was only room for one horse to pass. The Brigadier† went in front; the other four filed after him. My position, although not as unfavourable as it would have been in the street, where I should have been surrounded, still remained alarming; the blood flowing freely from my wound had, in a moment, covered my left eye, * * * I could not stanch it being obliged to defend myself against the Corporal who was cutting at me heavily. I parried as well as I could, going backwards all the time. After getting rid of my scabbard and my busby the weight of which hampered me, not daring to turn my head for fear of losing sight of my adversary, whose sword was crossed with mine, I told the light infantryman, whom I believed to be behind me, to place his musket on my shoulder and fire at the Spanish Corporal. Seeing no barrel however, I leapt a pace back, and turned my head quickly. Lo and behold there was my scoundrel of a Norman soldier flying up the hill as fast as his legs would carry him. The Corporal thereupon attacked with redoubled vigour, and seeing that he could not reach me, made his horse rear, so that his feet struck me more than once in the breast. Luckily as the ground went on rising, the horse had no good hold with his hind legs, and every time that he came down again I landed a cut on his nose with such effect that the animal presently refused to rear at me any more. Then the Brigadier losing his temper called out to the trooper behind him 'Take your carbine; I will stoop down, and you can aim at the Frenchman over my shoulder, I saw that this order was my death signal; but as in order to execute it, the trooper had to sheathe his sword and unhook his carbine, and that all this time the Corporal never ceased thrusting at me, leaning right over his horse's neck, I determined on a desperate action, which would be either my salvation

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† A Corporal in the French and Spanish armies.

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By Major R. M. RAINEY, 12th Regiment (2nd Burma Bn.), M.I.

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Unless in a very open country, with great inferiority of numbers, Mounted Infantry, well handled, if proper precautions are taken and proper tactics pursued, have nothing to fear from Cavalry."

"Mounted Infantry must never allow themselves to be taken by surprise by Cavalry, so as to give Cavalry a chance of charging them mounted. If an attack is pending, Mounted Infantry must, if possible, gallop to cover or enclosed and broken ground, and thence repel it and retaliate."

The Infantry Drill also touches on the employment of Mounted Infantry: thus in Part VI it is laid down that, "when Mounted Infantry is attached to an advanced guard, it will be most profitably used in moving rapidly to seize or hold special points, such as bridges, defiles, etc. Mounted Infantry may also be usefully employed in support of the reconnoitring Cavalry, by holding points on which the Cavalry may have to fall back, or otherwise helping to cover its retreat": again in Part VIII, Operations by Night, we find that Mounted Infantry "will be kept entirely separate," with the Cavalry and Artillery until day break. "Then, if the attack has succeeded, they will push forward with all speed, endeavouring to get round the flanks of the retreating enemy. If the attack has failed, they will do their utmost to protect the retreating Infantry by falling on the flank of the pursuing enemy."

The above extracts show very clearly the nature of the work that Mounted Infantry are expected to be able to perform. Numerous other situations suggest themselves where Mounted Infantry might be profitably employed; for instance, in the case of Horse Artillery with Cavalry, a detachment of Mounted Infantry would be invaluable, relieving the Cavalry of all anxiety for the protection of the guns and ammunition column, and thus releasing many extra men of the Cavalry for the actual charge, besides supplementing the fire of the guns during the action, and, together with them, covering a retreat of the Cavalry should the charge fail. In this latter case the presence of a detachment of Mounted Infantry might entirely alter the condition of affairs and would certainly greatly facilitate saving the guns. Their duty would be to protect the guns, especially on the flanks, to the last, should they (the guns) have received no orders or be unable to retire; while should the guns be ordered to retire, the withdrawal would be covered by the Mounted Infantry who should, if necessary, sacrifice themselves for this purpose.

As it is with Cavalry and Artillery that Mounted Infantry will be required to cooperate, it seems a pity that the drill books of those branches do not lay down any principles regarding the employment of Mounted Infantry when acting with them.

To enable Mounted Infantry to perform the duties expected of them, it is obvious that they must be fair horsemen; thoroughly trained in reconnoitring and scouting, and well mounted. Should they, through being indifferent riders, or badly mounted, be unable to keep up with Cavalry or Artillery, they cannot perform their duties; while ignorance in reconnoitring and scouting might lead to their own destruction if acting alone.

When employing Mounted Infantry it would be advisable to pause to consider whether, taking into consideration their means of locomotion and their training, they are capable of performing the work required of them.

The fear that Mounted Infantry would ape Cavalry and eventually become an inferior substitute for that arm, has perhaps caused some writers on the subject to undervalue the importance of giving Mounted Infantry really good mounts. Mules, cast horses, donkeys, indeed anything, have been sometimes advocated for this purpose. Mounted Infantry they would be, in one sense of the word, and even thus mounted they could perform some duties, but they could not "act in company with Cavalry" or "act alone in the absence of Cavalry," while should they find themselves pitted against Cavalry alone, and in at all open country, they would run every chance of being annihilated.

The same fear has perhaps caused the importance of Mounted Infantry being good riders to be overlooked. Of course, on the grounds of expense, it would be impossible to horse Mounted Infantry as well as Cavalry; but, remembering that they have no "shock tactics" when mounted, I will endeavour, further on, to show that, without poaching on the remount preserves of Cavalry, any number of suitable mounts could be obtained on the spur of the moment, in the event of even a large force of Mounted Infantry being organised, or an existing nucleus being augmented, in the case of war either at home or in India.

The absurdity of expecting badly mounted and insufficiently trained Mounted Infantry to perform the part laid down for them in Regulations, was throughly brought home to me at field days at Bangalore in 1885. I was then in the 1st Madras Pioneers and was handed over 50 men and 50 transport mules, with makeshift kit in the form of transport saddles converted into riding saddles, to train as Mounted Infantry. After a short training, quite as long, however, as it would be possible to give men organized nowadays on the outbreak of war, we were detailed to take part in the brigade field days. The duty we were generally told off for was escort to the Horse Artillery (*E. B.* R., H. A., the distinguished Maiwand Battery). My men were all bad riders, the saddles were cruel things to sit on, and the mules, peculiarly "cussed" brutes, either would not or could not keep up with the Battery. Had it not been that several officers attending the garrison class going on at the time, volunteered (unofficially) their services as whippers-in to the Mounted Infantry, and armed with hunting crops flogged up the mules, the gallant Battery would frequently have gone on without its escort.

It was not only in pace that the mules failed but also in scouting. Not one mule would leave the others, consequently, on one occasion, when I was ordered by the Officer Commanding the Battery to quickly occupy a tope about 400 yards off on one flank of the guns which were coming into action, I was obliged to trot up towards it without scouting. As we approached to within about 200 yards, I was thinking it was time to dismount and advance on foot, though I had reason to believe that the tope was unoccupied as some Cavalry of our own side had moved round that way a few minutes before. However, my mule stopping suddenly, shot me over her head. At the same moment a squadron of the enemy's Cavalry galloped out of the tope through a gap at right angles to our advance. Looking round, I was astonished to see that a similar accident had occurred to the whole of my men whose mules were standing still, gazing at the Cavalry over the prostrate forms of their riders. I promptly opened volleys at the Cavalry, and got in three before they had changed direction to charge us. An Umpire who must just have missed seeing our rapid and involuntary mode of dismounting, promptly put the Cavalry out of action for half an hour, and we had on this occasion to thank our mules for seeing us out of an awkward predicament.

Although it will probably very seldom occur that Mounted Infantry will be mounted on horses as good as Cavalry get, still, even with inferior mounts, they have a large sphere of usefulness, provided they are not given a task impossible for them to fulfil. To make up to some extent for inferior mounts, they must be kept as light as possible. Small men should be insisted on, and the kit and gear carried on the horses or ponies should be reduced to a minimum. There are now in India thousands of ponies used for polo, driving etc., which, in the event of a great war, their owners, a great proportion of whom are Army men, would have to part with. Here we have almost perfect material for mounting our Mounted Infantry. At home too, a large number of ponies and cobs would also be available. Animals such as these, (always remembering that Mounted Infantry never take part in shock tactics when mounted, and consequently that the highest rate of speed, would almost never be required, except in the case of Mounted Infantry acting alone, bolting to broken ground from Cavalry), could keep up with Cavalry and Horse Artillery under all conditions. If from any reason the men must be mounted on a slow or inferior type of animal, it is imperative that a sufficient proportion of good horses and ponies be given for scouting &c. It must also be borne in mind that they may not be able to perform in full the duties laid down for them in Regulations.

Mounted Infantry have been employed in various countries mounted on animals suited to the particular requirements of the particular *locale*. South Africa, Egypt, and Burma can all testify to the valuable services rendered by Mounted Infantry. In Burma there is a permanent establishment of Mounted Infantry ponies, of which there are about 450. Some 150 of these are allotted to British, and the remainder to Native corps. The ponies, all Burmans and Shans, are splendid little beasts well suited to the country, but would be unable to keep up in open ground with Cavalry. They are allotted 30 to 50 to different regiments. Relieving corps taking them over from their predecessors, except in the case of Burma Local Battalions which keep their ponies permanently. The advantage of this, as regards the efficiency in riding of the men, is very noticeable. Burma Battalions, always having ponies, have excellent riders in the Mounted Infantry, and in this respect they far surpass the Mounted Infantry of corps doing a tour of temporary service in Burma. In addition to the regular Mounted Infantry, there is a considerable force of mounted Military Police. Burma is a country where there is no Cavalry and the conditions of service are peculiar. The Mounted Police were originally armed as ordinary Infantry with rifle and bayonet. Experience proved that this armament was not altogether suitable to the peculiarities of service in the jungles. It is quite the exception to find the enemy in the open, and if he is so surprised he won't stand to fight but will bolt for the nearest cover. Leaving out of the question the case of a stockade, pagoda, or such like positions in which the enemy would await an attack, and under which circumstances ponies would be left behind and an attack conducted on foot in the usual manner, I wish to point out that men armed with rifle and bayonet only, have very little chance of inflicting much damage on an enemy whose tactics are to lie in ambuscade, fire, and then bolt. I believe that most officers who have had experience with Mounted Infantry in Burma, will agree with me that the best chance of success is to ride down the enemy with lance, sword, or pistol. By the time Infantry armed with rifle and bayonet only, have dismounted and loaded, the dacoits have probably gained cover, or are too far off for a man shooting hurriedly to hit with any chance of certainty. It must be remembered that the enemy will scatter at once, and that the target will only be single men running and jinking among bushes. The men quickly found this out, and I know that they frequently rode dacoits down, knocked them over with the butts of their rifles, and then dismounted and shot or bayonetted them. Some men tried fixing bayonets and using the rifle as a lance, while others, riding with loaded rifles, shot their man at the muzzle of the rifle, without dismounting. The Military Police authorities soon recognised this and the Mounted Police were given carbines, swords, and lances. They have practically ceased to be Mounted Infantry, and are really Cavalry. What would appear to me to be the best all round arms for Mounted Infantry (in Burma only) is a rifle with cutlass that could be fixed as a bayonet or used as a sword. This would enable them to deal with men in the open or rideable jungle, while they would still be in a position to dismount and undertake the attack on a stockade etc., and carry home the assault with the bayonet. This is a suggestion to meet a special case. Under ordinary circumstances the rifle and bayonet are the only weapons a Mounted Infantry man should have. No temptation to fight on horse back should be given. Whatever bucket may be issued for the rifle should be such that whenever or however the man becomes separated from his horse, he should remain a fully armed and equipped Infantry soldier. The Cavalry carbine bucket would be quite unsuitable. The bucket issued to Mounted Infantry in Burma is a very good pattern. The butt of the rifle rests in it, being plunged in some six inches. The man then passes his right arm through the sling. A strap—a wallet strap answers the purpose—buckled on to the upper swivel so that the man can pass his arm through it as a lancer does with his lance, is a great improvement and relieves the soldier greatly.

Leading the four ponies of a section when the other three men have dismounted for dismounted duty is an impossibility in dense jungle, on a narrow foot path, and on mountain paths, if it is attempted according to regulations. To meet this difficulty I have used a simple little contrivance which enables No. 3 to lead the four ponies in single file as transport animals are led. A piece of wood the thickness of a man's fore-finger and three inches long, is tied on to the back of each saddle by a leather thong (a boot lace will do) tied round the centre of the bit of wood. Each man on dismounting passes his reins over his ponies head, slips them over this bit of wood on the saddle of the pony in front of him, and runs a leather ring or stop which must be sewn over the reins up to the bit of wood. This only occupies about the same time as handing over the ponies to No. 3 in the usual manner. No. 3 of each section must ride first when moving in single file, otherwise no alteration is necessary in the drill.

Mounted Infantry saddles, on the lines of a Cavalry saddle, should be light and strong, and of a size to suit the animals for which they are intended. A blanket can always be carried under the saddle. Mounted Infantry, as a rule, wear ordinary ammunition boots, often nailed; many men ride with their feet home in the stirrup irons which should on these accounts be unusually roomy. I have frequently seen men hung up when dismounting hurriedly and some times dragged owing to the stirrup irons being too small. This is a point I do not think has ever been given sufficient consideration. As regards bits, a variety of these should be supplied. Mounted Infantry are as a rule hastily got together. The horses or ponies are not mouthed and broken as Cavalry horses are, and consequently it is unreasonable to suppose that one pattern of bit can be suitable to all kinds and conditions of mouths. If possible, bits with only one rein are preferable. A head-stall and rope of the colonial pattern is the best. All picketting gear, grain, men's rations, &c., should be carried on pack animals. It may be taken for granted that the horses will be small, and if they are to keep up with Cavalry and Artillery they must never be overloaded. If the men are decent riders and are wanted to accompany Cavalry across country, they should have short spurs, otherwise they will be left behind when it comes to jumping.

For carrying ammunition the bandolier is the best arrangement. Extra rounds might be carried on the belt in the same way. More ammunition could be carried in the men's pockets, and in the holsters when going into action.

The clothing of Mounted Infantry is an important point. In Burma an excellent waterproof cape with hood is issued, which is invaluable in a wet country, and wears remarkably well. A serge, patrol-jacket-shaped coat is also issued, khaki cotton cord breeches, and a pair of canvas gaiters. The serge coats are useless, catching on every thorn bush and tearing. Stout khaki drill or cord, with horn buttons, would be much more serviceable. The buttons issued are small metal buttons covered with serge which frays at once. A loose comfortable Norfolk-jacket-shaped coat with a low collar and shoulder straps, would be most suitable. The cord breeches are good wearing material and if worn with putties instead of gaiters would be good enough. As it is, the clothing being made in sizes, the breeches generally fit very badly at the knee, and slip up and down causing chafes. The loose ill-fitting gaiters give no assistance to keep the breeches in place, and men when on column duty often tie putties on to keep the breeches down, and put their gaiters on over the putties. If gaiters are issued, brown leather would look much better than canvas, which, unless pipeclayed, and pipe clay is out of place with Mounted Infantry, always look dirty and untidy. Of course articles suitable to one country might be out of place in another, for instance, in Afghanistan, poshteens might be substituted for waterproof capes, and extra warm clothing would be required.

So far I have only touched on Mounted Infantry mounted on horses and ponies or mules.

The useful work done by the Camel Corps in Egypt is well known, and serves as an instance of how useful Mounted Infantry may be, even though their mounts do not admit of their moving at the full speed of Cavalry. Camels can only be used in certain countries and are suited to special cases only, while their great value as transport animals would render it unlikely that they should come into general use for Mounted Infantry. Elephants are most useful in heavy jungle intersected with creeks, such as some parts of Burma. Bicycles are only suited to countries with good roads where they can save a lot of wear and tear to horses. They have more scope in Europe than in the East.

Infantry carried on cars and waggons, &c., would be invaluable under many circumstances and there are few countries where they could not go. The idea is not original. Colonel Wilkinson Shaw in his book "The Elements of Modern Tactics" says, that he suggested such an arrangement twenty-six years ago, and he invites officers to work out the idea. He suggested using waggons made from Artillery waggons specially adapted to the purpose. He writes : "The frame of the car to be in two parts and similar to the body and limber of an ammunition waggon to enable it to go over rough ground." Seats were to be fixed to each part of the waggon, instead of the usual ammunition boxes.

Personally, I should be in favour of cars built on the above lines as regards facilitating crossing bad ground, but with seats for the men to face outwards as on an ordinary Irish car. Each car to be drawn by four horses, each horse carrying a man. The car could have a box seat for the Commander. The well would contain ammunition and a few necessaries, rations, &c. The cars should be low enough for a man to fire over standing. They could then be used with great effect formed in laager to resist Cavalry. Were the cars surprised and charged by Cavalry when on the move, or should they be cut off or surrounded, it might be possible to charge or break through, the men remaining on the cars with fixed bayonets and firing at the closest quarters. A revolver might be carried on the saddle of each of the car horses to be used by the men riding them in such emergencies. An echelon of cars would have the best chance of breaking through. Infantry mounted on cars would require some men mounted on horses or ponies to scout for them. In an emergency as suggested above these men might rally behind the cars and get through in their wake. Such Mounted Infantry could at all events go anywhere that Field Artillery can. Under the present system Mounted Infantry is hurriedly called together in the event of war. Drafts from different regiments probably at the best only very moderate riders, mounted on ponies &c. are hurriedly collected. The men can have little knowledge of the management and care of horses. Officers, men, and horses, are all strangers to each other; the drill and conditions of service being novel to all. It is a marvel that under such conditions Mounted Infantry have justified their existence. And yet, in spite of what appear insuperable obstacles, in spite of the disfavour that they are looked on in some quarters, in the face of the most unfavourable conditions, they have invariably rendered good service. If under such a system good results have been obtained, what an efficient corps might be brought into existence if organized and trained under more favourable conditions? It is true that in many regiments there are men who have undergone some training as Mounted Infantry, but even admitting this, the bulk of the men would be much as I have described above. I have seen the Mounted Infantry of a good many regiments, both British and Native, after two years in the Mounted Infantry of their respective regiments in Burma, whose best friends and most ardent admirers could not claim for them either that they were good riders or knowledgeable in the care and management of horses; and yet these men had undergone an unusually long period of training.

Economy is the great point in favour of such a system, while the dread of Mounted Infantry apeing and eventually becoming inferior Cavalry, has perhaps something to do with continuing a system which can only produce imperfect Mounted Infantry.

Wars now a days may be expected to break out suddenly and to be terminated quickly. Under these circumstances it seems a trifle late in the day to commence organizing corps after war has broken out. It is generally admitted that there is a great field for the employment of Mounted Infantry, and there can be no doubt but that an Army which can have a highly efficient body of Infantry up with the Cavalry Division to support the Cavalry in the Cavalry duel, which, it is certain, will occur at the commencement of any great war, will derive a great advantage over its opponent The army whose Cavalry comes off victorious in this important preliminary conflict, will have reaped such valuable advantages that it seems folly to neglect any step that can facilitate the work of the Cavalry. Our Cavalry is second to none in quality, but is it, numerically, sufficiently strong to neglect assistance from the other arms? Unfortunately it is in the very first phase of war that such a grand field for the employment of Mounted Infantry exists, and it is during this all eventful crisis that, with our present system, Mounted Infantry is being organized. Under no circumstances can it be ready to take part in the first struggle for superiority. Is this true economy? If Mounted Infantry are, as the Regulations say, to operate with Cavalry, they should be as well trained, as well mounted, and as efficient in the work required of them as is Horse Artillery, whose special rôle is also to work with Cavalry. Without great expense a sufficient force of Mounted Infantry to fulfil these requirements could be easily organised. In India, as an experiment, a Native Mounted Infanty Corps of 800 men might be raised, small men equipped, clothed, and trained as Mounted Infantry, with 200 ponies as a permanent establishment to be made up to full strength by purchases on the outbreak of war, or when war was believed to be imminent. With this system all the men and Officers could be thoroughly trained in every branch of Mounted Infantry work. It would not be a medley of strangers thrown together, but a thoroughly efficient Corps under its own Officers. There would be sufficient horses or ponies thoroughly trained to do all the scouting and detached work, while the men, being efficient riders and accustomed to horses, would have little trouble with the new remounts received when ordered on service, and fewer sorebacks

&c., might be expected than occur now. I have already pointed out that there is every chance of a large number of suitable ponies being available. Or a Battalion might be formed of men partly mounted on cars. The Company is the tactical unit and would be uniformly mounted. For duties requiring especially good horses and riders, companies should be specially detailed. Men and horses having been drafted into certain companies for this purpose, the whole would be trained to ride, so that on the outbreak of war all the men could be mounted as ponies were bought; their places on the cars being taken by men volunteering from regiments, as is now done, to form Mounted Infantry.

THE INFANTRY SWORD EXERCISE
OF 1895.
By Major V. C. Tonnochy, 4th Sikhs.

It has been said by an authority on the sword—

"The death song of the Sword has been sung, and we are told that Steel has ceased to be a gentleman." Not so! and by no means so! These are mere insular and insulated views, and England, though a grand figure, the mother of nations, the modern Rome, is yet but a fraction of the world * * * The case is different on the continent of Europe. Probably at no period during the last four centuries has the sword been so ardently studied as it is now by the Latin race in France and Italy. * * * In the presence of arms of precision, the sword as a means of offence and defence may practically fall for a time into disuse. It may no longer be the arm paramount, to represent an idea. It may have come down from its high estate as tutor to the noble and the great. Yet not the less it has, and will ever have, its work to do.

The ex-Queen now appears as Instructress General in the art of arms. As mathematics are the basis of all exact sciences, so sword-play teaches the soldier to handle every other weapon. * * * A compendium of gymnastics, it increases strength and activity, dexterity, and rapidity of movement." It is therefore with pleasure that any one who cares for the ancient weapon must have hailed the advent of this new book

For the first time I may say, a system of fence for the sabre has been devised and strongly enjoined on all armed with the sword. For this all lovers of the weapon must be thankful. And there is no doubt that any one, who thoroughly mastered the system of fence here laid down, would be no mean opponent in the fencing school, or in war.

At the same time I trust I may be excused if, with every apology to the no doubt excellent swordsman who has compiled this book, I make a few suggestions in regard to it. Meaner men than Napoleon may, I suppose, discuss Napoleon; otherwise great men would have no critics, and the opposite is conspicuously the case. The book makes undoubtedly a sound and valuable addition to the exercises of the Army from the point of view both of swordsmanship and athletics. Yet there are some points open to remark.

In the first place was it necessary to go for a system of fencing to the Italians? There is now, (as indeed there always has been, although some times rather in eclipse) an English School of Fence. It has of late been brought to considerable perfection, and such a book as Hutton's 'Cold Steel' is a most excellent system of sabre-play, and one that will hardly yield to any continental one. It does indeed presuppose some knowledge of foil fencing. But surely it would not be too much to expect such a knowledge to be acquired at school, and to be shown by men coming up for the army examination.

Indeed I doubt whether much advance will be made in fencing till this is done.

It would be tedious here to compare the two systems, but I may note that some of the [illegible] of the [illegible] of the new system are that all the [illegible] are [illegible]. None of the parries with the back of the sword are [illegible] though with the sabre these are sometimes very useful as well as the "High Octave" of Hutton, a parry. I may remark by the way, [illegible] native fencers of this country [illegible] below the hip [illegible] and tiresome hanging guard instead of the "High Octave" of Hutton.

But what seems to me to call for most special remark in the book, is the omission to consider the use of the sword in war. The rest is amusement, this is business. Is it not a really serious omission? I think it will be seen to be so if we briefly consider the subject here.

The question is, under what circumstances is the Infantry Officers' sword likely to be used in war? The answer divides itself into three heads.

Combats.

(a) With a savage armed with spear or sword with or without a shield.

(b) With a civilized horseman armed with sword or lance.

(c) With an Infantry soldier with the fixed bayonet.

There is also the possibility of meeting as opponent an Infantry officer armed with a sword. But compared with the other three, this may [illegible] well to be a remote contingency. There is not a hint, however, in the whole book, as to how these three attacks are to be met.

Now an officer does not so much himself attack as lead his men to the attack. In doing so however, he must defend his life as best he can.

Let us consider each case in turn.

(a) The civilized swordsmen of the present day, even when armed with a pointed sword, seldom or never uses the point. They cut, as far as I have learnt, generally from the right downwards to the left. Such a cut, or any other, should be easily warded, and the *riposte* would be, if he had to shield a thrust, probably a cut say at his arm or leg. And in this connection the warning of another swordsman should be remembered "Never forget that it is more easy to make sure of a cut than it is of a thrust in the heat of an encounter."

(b) A horseman's sweeping blow or steady lance thrust requires a strong guard or parry and a sword of not too light a make.

(c) In European warfare, in a hand to hand combat, by far the most likely case is that of a swordsman having to parry a bayonet thrust. By far the most likely and by far the most difficult! But in this book there is not a word about sabre against bayonet.

To parry this thrust, one way at least is to grasp the sabre with the left hand, and by a strong sideward or upward push of *both* hands, to throw the rifle off, just as is done in quarter staff play.

The new sword is not well adapted for any of these three things being in my opinion, too narrow, insufficiently sharp along the front edge, and unnecessarily sharpened along the back edge.

However, as some one has said, "It is not so much the lover that woos as the lover's way of wooing," so it is not so much the sword you use, as the swordman's skill in using it. Officers are themselves apt to pooh—pooh the use of the sword, and consider that a Napoleonic *coup d'œil* is the most precious possession on the field of battle. No doubt it is, and let us hope we all have it.

Yet the sword is not without its history even in modern war. It has not unfrequently been used in street fighting or isolated skirmishes.

Baron de Marbot relates in his Memoirs how he saved his life with it. He was trying to get unobserved through a village on foot, when he came suddenly on five Spanish carabineers. One took him by surprise and got a cut in over his left eye. He says "I ran mechanically towards the houses on my right, in order to get my back against a wall, but by good luck I found, two paces off, one of the steep and narrow lanes which went up to the vineyards." The soldier (a recruit he had with him) had already reached it. "I flew up there too, with the five carabineers after me; but at any rate they could not attack me all at once, for there was only room for one horse to pass. The Brigadier† went in front; the other four filed after him. My position, although not as unfavourable as it would have been in the street, where I should have been surrounded, still remained alarming; the blood flowing freely from my wound had, in a moment, covered my left eye, * * * I could not stanch it being obliged to defend myself against the Corporal who was cutting at me heavily. I parried as well as I could, going backwards all the time. After getting rid of my scabbard and my busby the weight of which hampered me, not daring to turn my head for fear of losing sight of my adversary, whose sword was crossed with mine, I told the light infantryman, whom I believed to be behind me, to place his musket on my shoulder and fire at the Spanish Corporal. Seeing no barrel however, I leapt a pace back, and turned my head quickly. Lo and behold there was my scoundrel of a Norman soldier flying up the hill as fast as his legs would carry him. The Corporal thereupon attacked with redoubled vigour, and seeing that he could not reach me, made his horse rear, so that his feet struck me more than once in the breast. Luckily as the ground went on rising, the horse had no good hold with his hind legs, and every time that he came down again I landed a cut on his nose with such effect that the animal presently refused to rear at me any more. Then the Brigadier losing his temper called out to the trooper behind him 'Take your carbine; I will stoop down, and you can aim at the Frenchman over my shoulder, I saw that this order was my death signal; but as in order to execute it, the trooper had to sheathe his sword and unhook his carbine, and that all this time the Corporal never ceased thrusting at me, leaning right over his horse's neck, I determined on a desperate action, which would be either my salvation or my ruin. Keeping my eye fixed on the Spaniard, and seeing in his that he was on the point of again stooping over his horse to reach me, I did not move till the very instant when he was lowering the upper part of his body towards me, then I took a pace to the right and leaning quickly over to that side, I avoided my adversary's blow and plunged half my sword blade into his left flank. With a fearful yell the Corporal fell back on the croup of his horse ; he would probably have fallen to the ground if the trooper behind him had not caught him in his arms ". Then de Marbot taking advantage of the confusion in the narrow lane effected his escape. Forbes-Mitchell relates of Major Burroughs of the 93rd Highlanders that he "was an accomplished *maitre d'armes.* When he joined the 93rd as an Ensign in 1850, he was known as Wee Frenchie. I dont exactly remember his height, I think it was under five feet; but what he wanted in size he made up in pluck and endurance * * * It was he who volunteered to lead the *forlorn hope* when it was thought the Highland Brigade was to storm the Redan, and before it was known that the Russians had evacuated the position. At the Relief of Lucknow he was not the first man through the hole in the Secundrabagh wall but was either the fourth or fifth. He was certainly the first *officer* of the regiment inside, and was immediately attacked by an Oudh irregular sowar armed with *talwar* and shield, who nearly slashed Burroughs' right ear off before he got properly on his feet. It was the iron frame of his feather bonnet that saved him ; the sowar got a straight cut at his head, but the sword glanced off the feather bonnet and nearly cut off his right ear. However, Burroughs soon gathered himself together (there was so little of him !) and showed his tall opponent that he had for once met his match in the art of fencing ; before many seconds Burroughs' sword had passed through his opponent's throat and out at the back of his neck. Notwithstanding his severe wound Burroughs fought throughout the capture of the Secundrabagh, with his right ear nearly severed from his head, and the blood running down over his shoulder to his gaiters ; nor did he go to have his wound dressed till after he had mustered his Company and reported to the Colonel how many of No. 6 had fallen that morning." Many other instances of the use of the sword could be quoted and not a few here an Officer has been wounded by trusting to a revolver that did not go off instead of to his sword,—two within my own knowledge, However this is somewhat of a digression from the subject. In concluding I trust I may be lowed to express a hope that we may soon have a fencing school at the Head Quarters of each Command, and so all armed with the sword may have opportunity " to acquire facility and skill in the use of that weapon.

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† A Corporal in the French and Spanish armies.

MILITARY EDUCATION & LITERATURE

BY

LIEUT. D. M. BOWER, 2ND (Q. O.) BENGAL LIGHT INFANTRY.

"Good officers cannot be formed unless they incessantly labour to educate themselves."—*Order of Field Service, German Army.*

"The soldier who dares to risk the lives of men entrusted to his charge without making study for his own education of the experience of the past, is a criminal more dangerous to his country than any murderer."—*Sir C. Napier.*

"If I am always prepared, it is because before entering on any undertaking I have meditated for long and have foreseen what may occur. It is not genius which reveals to me suddenly and secretly what I have to do in circumstances unexpected by other people; it is reflection,—it is meditation."—*Napoleon.*

The above three quotations will demonstrate, far better than any argument I can employ, the imperative necessity for conscientious study. I will at once proceed to indicate what, in my humble opinion, is the best course for officers to pursue who desire to excel in their profession. In the first place I will point out—

WHAT NOT TO STUDY.

Upon nothing does greater misconception exist than on military matters. One reason may be found in the amount of worthless works with which the military world is inundated. When "exposed to the light they turn out to be trumpery rubbish made use of to show off the author's learning. So little is gained, by their study, that theory, on account of them, has always been a true antithesis of practice, and frequently a subject of ridicule to those whose soldierly qualities in the field are above criticism." It is only recently that a text book was in use at the Staff College which consisted of nothing but garbled history and incorrect logic. Books which treat of the military art according to rules and regulations are equally bad. The following quotations will explain the matter:

"The field of genius raises itself above rules."—*Clausewitz.*

"Talent and genius act beyond the law."—*Clausewitz.*

"The man, who simply crams his pupils with the dry bones of drill and regulations for field service, turns out only military pedants."—*Capt. Buddecke, Prof. of Tactics, War School, Berlin.*

"It is a miserable philosophy if, according to the old plan, we establish rules and principles, wholly regardless of all moral forces, and then as soon as these forces make their appearance, we begin to count exceptions which we thereby establish as it were theoretically, that is make them into rules; or, if we resort to an appeal to genius, which is above all rules, thus giving out by implication, not only that rules were made for fools, but also that they themselves are no better than folly."—*Clausewitz.*

I think that the greatest fault to be found in the writings of our military pedants and schoolmen is, not that they are so absurdly inaccurate and fall so far short of the truth in trying to establish facts, or push theoretical speculations far beyond their proper limits, but that they forget that in dealing with military matters what relates to human nature must claim our first attention, and all that appertains to it is the most valuable knowledge which the mind of the officer can acquire from a study of military history. In the case of infantry fire for instance, the fact of the weapon being a magazine rifle, or a muzzle loader, is a small matter compared to who stands behind it.

Clausewitz says that "we must give a caution against attaching to general relations, such as base, ground, &c., an importance and a decisive influence which they do not in reality possess. Is there to be found, viewed generally, a more absurd situation than that of Turenne in 1675, when he stood with his back close to the Rhine, his army along a line three miles in extent, and with his line of retreat at the extremity of his right wing? But his measures answered their object, and it is not without reason that they are acknowledged to show a high degree of skill and intelligence. We can only understand this result and this skill, when we look more closely into details, and judge of them according to the value which they must have had in this particular case."

It can easily be shown by historical examples how unreliable is common sense alone; but common sense will be found a safer support than the text books of pedants. Here is an example taken from the writings of general Von Verdy du Vernois which will illustrate what I mean: "The first battle in which I took part was that of Nachod. I found myself on the brim of the plateau of Meuzelberg. Violent fight was raging, and our troops were in a very bad way. The companies of the advanced guard, as well as the battery, were retreating, while the main body was still in the defile. If at this moment the Austrians had succeeded in maintaining themselves on the plateau, the deployment of our troops could not have been carried out.

I called to mind all the tactical rules imaginable, but I could not find one which would apply to this particular case. I then sent all the rules to the devil, and simply asked myself what ought to be done here? I became convinced that all the troops that had set foot on the Meuzelberg, ought to maintain themselves there at all risks, and that the remainder ought to hasten up and join in the fight wherever they were wanted.

From that time, I experienced a repugnance for anything in the shape of rules."

WHAT TO STUDY.

In indicating what, in my humble opinion, are some of the best works to study, I have not the smallest intention of assuming the ridiculous position of criticising in any way the works I have ventured to mention. I will merely point out what appear to me to be the particular advantages to be derived from studying them.

"*The Battle of Custozza*," a tactical study by Von Verdy du Vernois, translated by Henderson. This is one of the best works on Tactics ever written by any author in any language. The student will have to solve a series of problems similar to those which might fall to the lot of any officer on the battle-field. The translator points out that "it cannot too often be repeated that war presents a constant succession of problems to be solved, not only by the superior leaders, but by every officer in command of troops, no matter how small his charge may be." This will train our minds to rapid decisions, and increase our store of knowledge. Moreover we will soon recognise the value of this method by the facility with which we will discover problems to discuss and solve.

"*Tactical Studies*" by Von Moltke, translated by Von Donat. The great interest of this lies in the way in which Von Moltke criticises the solutions of the problems by his officers. It is hardly necessary to state that a soldier endowed with such a master mind is most indulgent in his criticisms. A careful study of this work cannot fail to afford most valuable mental training.

"*The Battle of Spicheren*," a tactical study by Major Henderson. By following the system recommended by the author, "The intellect is brought into collision with reality, and the contact is little less impressive than practical experience," The habit of quick resolution and a comprehensive *coup d'œil* will be developed. Moreover he states that "it is in the novelty the danger lies; for the danger of novelty is surprise, and surprise is the deadliest of foes. Reduce to a minimum the chances of surprise; let a man be always prepared, and it loses half its danger." And further he states that, "as the principal duty of the officers of to-day is the instruction of their men, the deeper the knowledge of the instructor with what his men have to be trained for, and the clearer his insight into the difficulties he and they will have to encounter, the sounder will his work be."

It cannot be too strongly impressed that details afford the most precious teaching. They are even more important than general principles. I advise all officers who desire a mastery over details, to study carefully the incomparable works of Von Verdy du Vernois. Amongst the number, I may mention *Studies in Troop Leading*, translated by Lieut Hildyard; the *Cavalry Division* translated by Harrison; the *Tactical War Game* translated by MacDonnel. This is a most valuable little work, even for officers who will never play the War Game. Also *Etudes de Guerre*, French translation by Capt. Monet.

As an antidote to the false teachings of pedants, I think nothing could be better than the three following works of the true Clausewitzian School.

"*War*" by Clausewitz. Should any reader be inclined to consider this work out of date, I may state that the principles which applied in Clausewitz's day, apply equally to ours.

"*Letters on Strategy*" by Prince Kraft,—of which a French translation can be procured. The Prince writes these letters in an interesting and chatty style and gives one a most vivid picture of real war.

"*The Nation in Arms*" by Baron Von der Goltz. A most fascinating and useful work written by one of the greatest living masters of the military art.

"*The Order of Field Service for the German Army*" translated by Spenser Wilkinson. A most useful little book which all officers should possess. I take the two following extracts from it: "Many points of field-service have been intentionally left open in order to give scope to officers of all ranks to make up their own minds and act according to their own judgment. Under no circumstances whatever, is this absolutely necessary independence to be restricted by rules laying down forms not given here." "Determined action to gain the object in view must be demanded above everything else. Everyone from the highest leader to the youngest soldier, must always bear in mind that neglect and carelessness will weigh more heavily against him than error in the choice of means."

I think that the two above extracts give the key note of the German system, and look how well it worked in the war of 1870 & 1871. At that time they took the field relying on the support of contingents almost entirely untrained. with a most inefficient Cavalry, tested the day of Vionville, with the worst infantry weapon in Europe, and with gunners of whom barely one-third had been trained to shoot. Yet they won; "because decentralization acting over a long period of years, had given them an exceptional percentage of officers, both on the staff and in their regiments, trained to accept the responsibility of their own actions"—*Maude*.

It is most important that British Officers should throughly understand the working of the Transport and Commissariat. Administrative details are the greatest difficulties in all our small wars. Unfortunately, reading officers are apt to devote their attention only to the more attractive parts of the military art. "*The Organization and Administration of the Lines of Communication in War*" by Colonel Furse, is one of the best works on the provisioning of troops in the field that I have yet come across.

There can be no doubt that one of the most interesting and useful wars for British Officers to study is the American Civil War. In a study of that war one realizes the splendid fighting qualities of the English speaking races; the experiences of highly intelligent privates add an exceptional feature of interest, and the surface of the country will be found very similar to that to which we are accustomed in India. There are thousands of works on the war, and the number is steadily increasing. In the following list I give a few that have come under my own observation:

The four volumes issued by the Century Co.; *The Campaigns in Virginia, Maryland, &c.*, by Chesney; *Histoire de la Guerre Civile en Amérique*, 6 Vols., by le Comte de Paris; *Destruction and Reconstruction* by Lieut. General Taylor, C.S.A.; *Life in the Confederate Army* by W. Watson: *History of the Campaigns of Stonewall Jackson in the Shenandoah Valley* by William Allan; *Memoirs of the Confederate War of Independence* by Heros Von Borcke; Scott's *Partisan Life with Mosby*; the *Biographies* and *Memoirs* of Lee, Grant, Sheridan, Shearman, Johnstone, &c.

The above list of works is of course only a very small number of some of the best works which officers might study with great profit to themselves and their regiments. If only as much time and attention were devoted by officers to study and the practical war training of troops, as is spent over useless formalities, the fighting value of the Army would be increased enormously, and that without adding a farthing to the Budget. What better advice can we have than that of Lord Wolseley who says, that we should "at once give up the humbug of the barrack square, and its aimless exercises." In place of this, "let officers and men be practised, over and over again, in the open, in the various phases of a fight, teach them to think and act for themselves like a well trained polo or football team, and depend upon it, when the hour of trial comes, neither officers nor men will be found wanting."—*Norman Bray.*

NOTES ON MOUNTAIN WARFARE

BY

A FRONTIER SOLDIER.

"*Ducit Amor Patriæ.*"

Introduction. Special troops. Choice of an objective. Proportion of the three arms. Marches. Place of officers on the line of march. Normal order of march. Pace. Halts. Flanking parties. Baggage and baggage guards. The attack. Infantry in attack. Retirements. Supply of ammunition. Outposts and picquets. Camps and bivouacs. Jungle fighting. Followers. Telegraphy. Signalling. Camp Equipage. Transport.

Introduction.

Owing to the enormous area and extent of ourIndian Empire containing as it does countries which have the utmost extremes of climates, at one time the hottest and coldest, the dampest and driest spots on the face of the globe, a paper dealing with Hill Warfare in India to be at all complete, must necessarily be divided under several heads.

The force, tactics, and dispositions, which would be suitable against the wild and badly armed tribes of the Chin Hills or the malarious forests of Burma, would be quite out of place against the hardy and brave mountaineers of the North West Frontier. Not only does this change of locality affect the strength of the force, the proportion of the three arms, and its dispositions when it meets the enemy, but it also renders it necessary to vary the outfits of the troops as well as the details of supply and transport, on the latter two of which success so much depends.

In the compilation of the following notes references have been made to all available sources of information, and the writer has borrowed not only the ideas of others but in some places their language also. Although the writer has had the good fortune to take part in several of the expeditions which have taken place during the last few years on the North West Frontier and in Burma, he does not lay claim to be at all an authority on the subject of which he writes but rather offers these notes with considerable reticence to a public many of whom are so far more able than he is to act in the position of instructor.

In late years there have been numerous expeditions against the unruly tribes on our extensive frontiers in India, and any officer who has had even ordinary good fortune should have had some experience of the manner in which hill warfare is carried on by the Indian Army.

The young officer straight from Sandhurst or the Militia, well crammed with all the latest ideas of the art of war as practised by European nations, and fully competent in his own opinion to command a Division or even an Army Corps on paper, will be liable to draw invidious comparisons between the strategic examples set forth in Hamley's *Operations of War* and the apparently plain go ahead system as practised in India by our successful commanders; but, although he may not at first perceive it, the main principles of the art of war remain unaltered, whether the scenes of the campaign be on the plains of Europe or in the remote highlands of the Himalayas, or in the dense forests and swamps of Burma, and an Indian General can no more afford to neglect these principles than could the Generals who vainly endeavoured to make stand against Napoleon. But while following these principles some thing still more is required. The enemy's tactics and methods of fighting must be studied and these methods to a great extent must be adopted by our troops as they are invariably well suited to the country. Savage nations never expect our troops to venture into their fastnesses and become demoralized if they find their enemy as well able as they are to move through their forests and climb their rugged and steep mountains. Their tactics carried out by highly disciplined and well armed soldiers will generally be fatal to them, but "the blow must be struck hard and struck quickly." The examples of Lord Roberts' campaigns in Afghanistan and more lately the expeditions under Sir William Lockhart may well be studied in this respect. With strong columns, lightly equipped, and with little or no transport, rapid marches were achieved in trackless country and all opposition was disorganized by the rapidity of their movements combined with the energy of their attack.

On account of the difficulty of carying supplies in wild and trackless districts, the force used should always be the smallest compatible with safety, but to prevent any delay, should the opposition show signs of being more serious than was at first anticipated, a strong reserve should invariably be assembled at or near the base of operations. It is very seldom that British troops are attacked in the open by the hill tribes of India ; the superiority of our weapons being so great that such a proceeding would be hopeless and for the same reason the enemy will seldom await the attack of our troops in open country. They prefer to retire to the most inaccessible points of their country or hold difficult passes on the road which they know our troops must cross to enter their territory. From these postions they are well satisfied they can inflict loss on any troops that may be so bold as to attack them.

The nature of mountain and jungle warfare necessitates the breaking up of units, and therefore demands from subaltern officers and even from non-commissioned officers a spirit of initiation and special aptitude which must be fostered and educated in times of peace. Much is demanded from the junior ranks, but even more is required from the commander of a force. *L'audace encore l'audace et toujours l'audace* should be the motto for the commander of disciplined troops against wild Asiatic tribesmen.

The question of the use of special troops for mountain warfare is one deserving consideration. On the continent of Europe "the necessity for a body of men and officers specially armed, trained, and exercised for a species of struggle differing in principle and practice from the warfare of the plains almost as widely as does sea fighting from either, has long been insisted upon," and is now a reality, the French, Austrians, and Italians having bodies of troops specially raised and trained for mountain warfare. In the British Army no steps have yet been taken in this direction beyond the raising of a special body of mountain artillery.

The Duke of Wellington said that he had never heard that our troops were not equal as well in their personal activity as in their arms to contend with and overcome any natives of hills whatever. And while this saying of our greatest General has been proved true by events, times without number, the necessity or rather the advantage of equipping and training and even arming our troops in a manner suitable to the country in which the compaign is to take place, has been clearly demonstrated; and we have often suffered loss and even disaster from the unsuitability of equipment and the lack of training of our regular troops in mountain warfare. With the exception of the special batteries of mountain artillery we have been content to trust to the ordinary infantry of the line aided by irregular troops. How nobly our regiments have done is shewn by our present position in India. But in spite of our successes the want of a more suitable equipment and training has often been felt.

During the Black Mountain Expedition of 1852 we read that "the regular troops were in a confined narrow valley encumbered with impedimenta, double poled tents, doolis, palkis, and hundreds of camels; in short the column was equipped as if for an ordinary march and not for mountain warfare." The fighting during this expedition fell entirely to the lot of the irregular troops, the police and the friendly tribal levies, the Government having given orders that the regular troops were not to be employed on the mountain. The irregular troops occupied points along the line of march behind which the "encumbered regular column laboriously but securely threaded its way through the mountain defile." Since that date our regular troops both British and native have been gradually but surely made more mobile. Experience has taught us a lesson, but, the lessons have been hard to learn, and even now "the use of picked men is ignored and every Thomas Atkins from Whitechapel, or Ram Bux from the Benares bazar, because he has been taught the goose step and is dressed in the conventional garb of a soldier, is regarded as fully competent to face the Afridi or other hill man, who, a warrior by birth, is engaged in defending his own native hills, and is fighting for all he holds dear on earth."

It was at one time believed that troops who were trained in hill tactics and lightly equipped for mountain warfare would be unable to compete with the regular troops in the plains—it was thought that they would be wanting in that cohesion, discipline, and regularity of movement which is considered, and rightly considered, to be so necessary with troops working in the plains; but so far from this being the case the irregular troops and more especially those of the Punjab Frontier Force, have shewn that it is possible for regiments trained to hill tactics to compete favourably with other regiments in every respect, and it is now generally admitted that "troops trained for mountain warfare will find all other "services come easily to them, whereas those that have never quitted the plains will find themselves quite out of their element in the hills."

The natural result of this teaching was that the regular regiments were gradually remodelled on the lines of the irregular corps. The change however, was very gradual, as it was almost impossible to convince the officer who had never seen war carried on outside of our Indian Empire, that the British soldier could exist on service without his double poled tent and an army of followers to cook for him and wait on him.

Even now the followers are far too many and add greatly to the difficulties which all expeditions have to contend with. Our army administrators have much old fashioned prejudice to contend with, but gradually and surely the Indian Army is being made more mobile.

Choice of an Objective.

When the Government has decided that an expedition against any of the tribes inhabiting the mountainous tracts on our frontiers is necessary with a view to punishing them for past misdeeds, the General who has been selected to command the force must decide on an objective, and then so time the deparature of the force that this object may be satisfactorily achieved. It is seldom that these uncivilized tribes have a capital or chief town, the occupation or destruction of which would induce them to offer submission and accept our terms; hence, the first object should be invariably to attack and destroy all armed resistance wherever it may be met, and kill as many of the fighting men of the tribe as possible. In addition to this, every endeavour should be made to capture and destroy what the enemy prize most, this will generally be their cattle and crops, the latter either growing in the fields or stored in the villages. The villages are as a rule mere hovels, to burn and destroy which does little harm as they can be quickly rebuilt, and their destruction has the disadvantage of temporarily inflicting great misery on the women and children, and also unnecessarily enrages the people against us. It is much to be hoped that, in future expeditions, this wanton cruelty will be strictly forbidden by the Government, except under very special circumstances, instead of being enforced, as it is at present, contrary to the dictates of humanity and the feelings of the soldiers. It is true that the destruction of grain may inflict equal distress, but the inhabitants secrete this so carefully that very little is ever destroyed.

The best time of year to inflict this punishment on a hostile tribe, is when their crops are ready to cut, when serious loss can be inflicted by the destruction of the standing corn.

To capture their cattle is a more difficult affair, as the Government only resort to active measures as a last resource, after all other means of bringing the tribe to terms have failed, and so the enemy have plenty of warning of our intentions and drive off their flocks and herds into places of safety.

They are very clever at hiding their stores of grain and other valuables by burying them in holes in the ground, either in the floors of their huts, or in the fields round the village. Advantage is also taken of caves and holes and corners in the rocks, and it often requires an experienced hand to discover these stores, so skilfully are they concealed. Once the objective has been accomplished and all armed resistance has been put down, it rests with the Government to decide on the future movements of the force. It must be borne in mind that in warfare against the mountain tribes it is often more difficult to retire than advance, the enemy emboldened by the retrograde movement are encouraged once more to renew their aggressions, and to retire in an orderly manner and without loss often requires a very skilful handling of troops.

Proportion of the Three Arms.

The infantry is the principal arm alike in the hills and the plains and on it rest the principal duties of attack and defence. In attacking strongly fortified positions it requires the aid of artillery and engineers, and, if the country is not too rough, the aid of cavalry and mounted infantry, as the movements of infantry are slow both for reconnoitring and pursuit. In mountainous districts cavalry can, however, seldom be of use, and would only be an encumbrance. The same may also be said of wheeled artillery. It is difficult to fix the proportion that mountain artillery should bear to the infantry. If the country is very difficult and the inhabitants brave and sufficiently well acquainted with the rudiments of fortfication to entrench themselves in strong positions, the proportion of artillery with a force should be increased, but if, on the other hand, the country is open and the people are unlikely to offer serious resistance, the artillery can be reduced. Artillery is always an encumbrance on a narrow mountain path, the number of batteries should therefore be kept as low as possible. One battery to every three or four battalions appears to be the normal proportion, but it may on occasions be increased to one battery to every two battalions.

Marches.

When marching in forests or mountainous countries, troops and baggage animals will almost invariably move in single file, owing to the paths or tracks being seldom wide enough to allow any other formation. The result of this is that even a small force extends a great distance without taking into consideration the distances lost on the line of march, which, owing to the steepness of the paths and the obstacles which are met with, are always very much greater than in the plains. To keep the column well closed up it is therefore necessary to halt the head of the column continually and more especially when owing to the nearness of the enemy any serious opposition is expected.

These continual halts are very trying to the men as they prolong the march unduly. It is therefore advisable, whenever possible, to move a large force by several adjacent routes or tracks which should converge on the objective or point of attack.

When a large force moves by one road and the head of the column is halted to rest the men and allow the rear to close up, it must be borne in mind that to allow the men in rear any rest at all, the duration of the halt that is considered needful must be counted from the time when the rear of the column is reported to have closed up. If this precaution is not taken, the rear units of the column will toil on without any rest, and this will lead to straggling, whereby the column will be even still more lengthened out.

In cases where, from the nearness of the enemy or the absence of any other suitable line of advance, it may be found necessary in spite of these objections to move a large force by one road, the length of the march must be proportionately curtailed to enable the rear guard to reach camp before dark.

If the force is moving at a distance from the enemy and there appears no probability of interruption, a force consisting of several brigades can move with comfort on one track, provided arrangements are made for one brigade to follow the other at such a distance as to prevent all possibility of the second column overtaking the rear guard of the leading column and mingling with its baggage animals. This is the duty of the staff. Nowhere is an efficient staff more necessary than in mountain warfare and they should be invariably selected from officers who have had experience of hill campaigning. There appears to be no necessity for observing the usual intervals between the various units which are customary when marching in the plains. Each corps should follow the one in front as closely as possible. Straggling or rather opening out will be impossible to prevent, but the criterion of a well disciplined corps should be whether the men keep well together or not. All doubling and stepping out must be strictly prohibited. Should the rear of a corps be unable to keep up, the head of the corps should decrease its pace, and word be sent forward to the head of the column informing the column commander of the fact, when the head of the column should be halted or the pace should be decreased. To force the pace unnecessarily is to fatigue the men, and it is disastrous to the pack animals and their loads.

In a column on the line of march each unit must be kept complete, the reserve ammunition, entrenching tools, pakhals, and dandies, should follow closely behind each battalion In a defile or on a narrow mountain track, it is impossible to get up ammunition &c., from the rear, without great difficulty and loss of time. This may appear to unnecessarily lengthen the already long line of combatant troops, but experience has shewn that it is very necessary to keep each unit complete on the line of march. At times, owing to the difficulties of the road, it may be necessary to leave even the ammunition and entrenching tools and pakhal mules behind with the baggage until the engineers can make the road passable for transport animals. Whenever this is the case, and should opposition be anticipated, the men should fill up their water bottles, and extra packets of ammunition should be served out, which the men should carry in their haversacks. The custom of allowing mules for the carriage of great coats is an excellent one, but these mules should not be relegated to the baggage line but follow in rear of the battalion with the ammunition mules, so that, should a corps be sent on any duty where transport mules were unable to accompany them, the men could take the great coats with them.

Places of Officers on the Line of March.

The place of all Officers on the line of march, either when distant from or in the presence of the enemy, should be immediately in front of their respective commands. The officer commanding a battalion should lead his battalion, and the officers commanding companies should lead their companies. From this position is it alone possible for a commander to exercise an affective supervision over his command. The narrowness of the track compels the commander to follow the man in front of him in single file, and, were he to follow in rear of his command, he would find it difficult to keep himself acquainted with what was going on in front, and it would also be difficult to convey orders to his command.

The commander of each unit should detail an officer to follow in rear of his unit, who would be responsible that the men did not straggle or fall out without permission. The commander of a unit should occasionally, when the width of the path allows him, fall to one side and allow his command to file past him, regaining his position at the head of his command as soon as check or halt enables him to do so. In this way will he alone be able to keep himself acquainted with the condition of his men and animals.

There are two exceptions to the rule concerning the position of officers.

1. The officer commanding the advanced guard, should be at the head of the main body of the advanced guard.

2. The officer commanding a column or brigade, should be at the head of the main body of the column.

In these positions they are both ready to receive reports as soon as they are sent in by the scouts of the advanced guard, and are able to proceed without delay to reconnoitre the ground or the enemy's position, and are able to make what dispositions the necessities of the case may require without unduly disturbing the march of the column.

In the French Army the positons of officers is exactly reversed: all officers except column commanders moving in rear of their respective commands. The positions indicated above are those most generally adopted by the British Army, and there appear to be many advantages in their favour.

Normal Order of March.

The usual division of the column into advanced guard, main body, and rear guard, holds good in mountain warfare; but, owing to the already extended line in which it has been shewn that the column must march, there appears to be little advantage to be obtained in having a strong advanced guard separated by a considerable distance from the main body, thereby still more prolonging the already over long line of march. It appears, therefore, that the advance may be considerably reduced from the proportion laid down is our text books. The nature of the country also admits of a few men, well armed, retarding a large force. A company is therefore considered a suitable force for an advanced guard. If the country is suitable, a company of mounted infantry should form the advanced guard, but if the country is too difficult for them, a company of infantry should be told off for this work. The company should consist of picked men who have been thoroughly trained as scouts, and who are, if possible, well acquainted with the enemy's tactics. They should be accustomed to work together and understand how to communicate with one another by means of signals.

The leading battalion of the column should follow the advanced guard at such an interval as the nature of the country shall demand, generally from 200 to 400 yards in rear. If for any reason the distance between the column and the advanced guard shoud exceed 400 yards, the leading battalion should send forward one or two companies to support the advanced guard and keep up communication with the main body.

The best position in the column for the mountain artillery appears to be a subject of dispute. To settle its position it is evidently necessary to ascertain what are the duties of this arm in mountain warfare. When only moderate resistance is anticipated it does not appear expedient to call in the aid of the artillery, because the chief aim and object of expeditions is usually to destroy as many of the enemy's fighting men as possible. Now it is well known that owing to the very great improvement in modern mountain artillery, the accuracy of their fire, and the length of their range, savages can be turned out of a strong position by shell fire alone; but this result is achieved more by the moral effect which accurate shell fire has on the enemy, than by the loss which it actually causes. Hence it does not appear to be advantageous to use artillery fire unless its aid is actually required to enable the infantry to get to close quarters. During the last few expeditions there have been repeated examples of this misuse of artillery fire. By its use the lives of a few infantrymen have undoubtedly been saved, but to save the lives of a few men is not the rôle of any arm. The use of artillery fire, when not needed to prepare the way for infantry, prevents the infantry ever getting near their enemy. They are frightened off by the shell fire. Nothing so much cowes the average hill man than to be worsted in a hand to hand conflict, and the General who can bring his infantry up close to the enemy, and inflict one crushing defeat, has the country utterly at his mercy. The enemy who retreat before shell fire alone, naturally explain away their defeat: they have no guns and therefore how can they stand up to British troops? But if they are defeated in a hand to hand engagement, they know the game is up. By a too common use of artillery fire there is also a danger that the moral effect of shell fire will decline. The guns should be used only against the enemy in force, and against strong entrenched positions, and not against individuals as is so often seen. As the artillery are only required, therefore, when a regular attack is to be made, and as previous to any attack considerable time must elapse while the infantry are being pushed to the front to reconnoitre, there appears no necessity for the artillery to be in front of the column. The best place for them to march in the column appears to be behind the leading brigade, or, at any rate, there should be two or three battalions in front of the batteries.

Pace.

In mountainous countries it is most difficult to estimate distance the tracks wind through ravines, and zigzag up and down hill in such a manner as to make an even and regular pace impossible, while the constant halts and checks owing to the difficulties of the road add to the uncertainty which must exist in any calculations. Men accustomed to hill climbing and well trained in hill manoeuvres in times of peace, can, if not over loaded, keep up a fairly regular pace; at steep ascents, the pace will naturally slacken, and at descents the inclination is to step out. In the Indian Army the men's loads are, whenever possible, reduced to a minimum, contrary to the European custom where the troops trained for Alpine warfare carry loads which a Kashmiri coolie would groan over. That the Indian custom is the most suitable for our requirements there can be no doubt. Were our soldiers encumbered with such loads as are the French and Italian mountain troops they would be quite incapable of climbing hills in pursuit of the hardy and lightly clad mountaineers of the North West Frontier.

The leader of a column must be careful not to force the pace too much : he must remember that he is far more lightly equipped than his men. At the commencement of a campaign, before the men are inured to the exertion of hill climbing, any attempt to overtire the men by long or rapid marches should be discouraged, but in a very short time the pace and distances can be increased. " In mountain warfare above all others the secret of victory lies in the legs," and by its successes in the field, an army which has in times of peace devoted time to the physical training of its troops will be well rewarded.

An officer at the head of a column has often opportunities of looking back across a valley or re-entrant and noticing how his men are marching. If he sees them well locked up and without intervals, he may know that he is leading his men too slowly, and should increase his pace accordingly. If on the other hand he sees straggling stepping out and long intervals between units, he should decrease his pace, and, if necessary, order a halt.

It is always desirable to order a halt as soon as the top of a steep ascent has been reached, and the men should be allowed to rest a short time before the descent is commenced. Moutain batteries with their well trained men and mules, generally picked men and specially selected mules, and with the men more lightly equipped than their comrades of the infantry, are able to keep up a quicker and more regular pace than infantry, unless the difficulties of the road are so great as to keep back the mules.

Halts.

Halts should depend rather on place than on time. Halting at regular intervals is not suitable on mountain tracks. Halts should be called after a particularly bad or steep bit in the road ; they should be avoided if possible in narrow defiles or on steep slopes. If an ascent is very long and steep, it may be necessary to call several halts, especially if the men appear exhausted and are inclined to straggle. During descents halts are not so necessary, unless the pace has been very quick, and it is necessary to give the men time to recover their breath. A halt should always be of sufficient duration to allow the rear of the column to benefit also by the rest. If the column is a long one the duration of the halt will have to be prolonged accordingly.

Flanking Parties.

On the line of march in hilly countries and in forests, the duties of the flanking parties are specially onerous, and so much depends on the efficient performance of this duty that its importance cannot well be overestimated. A column trailing along a narrow tortuous path would be liable to suffer heavy loss from an enterprising enemy who had possession of the heights on either flank, if the duties of guarding these flanks were omitted or negligently performed. The track may lead either through a defile or up a spur of a mountain with other spurs within range on either flank; in either case the flanks must be specially protected, and the same holds good if the column is moving over rough and broken ground. In moving along a ridge or saddle back, the flanks will be less liable to attack as an enemy would have to ascend the hill to deliver the assault. At a distance from the enemy the flanking parties might consist of a few scouts detached from the advanced guard, but in the presence of the enemy the flanks must be held by strong parties detached from the leading battalion or from troops specially told off for the purpose. The position these flanking parties should take up depends so much on the country that is being traversed, that it is impossible to lay down any rule as to the distance they should be from the line of march of the column, but it may be taken as a general principle that they should occupy the ground on either side from which an enemy could hinder or annoy the column, and the flanking parties must be of sufficient strength to drive back any force the enemy may bring up, or at least be able te hold he enemy until reenforcement can be sent to their assistance.

The flanking parties in moving along the heights on either side must keep level with the head of the advanced guard. Strong parties must be left on specially commanding points to remain there until the column has passed.

There are two system of supplying these flanking parties, depending on the nature of the country to be traversed. In the one, the force which provides the flank guards moves itself along the flanks of the column, and leaves detachments on commanding points as it advances; and in the other, the detachments are sent up from the column itself, but somewhat in advance of it, to hold important points. The former would be used where the hills on either side ran along fairly even and level once the crest is reached, while the latter would be the least fatiguing for the men if the ground is very broken and uneven. It will often be found impossible to crown the highest points commanding a defile, owing to their inaccessibility, in which case the flanking parties must be content to hold the underfeatures. When advancing up or down a hill, in which case the road will generally be found on a spur, the flanking detachment should move along the spurs on either side of the one occupied by the column. In many cases owing to the difficulties of the ground it will be found absolutely impossible to have flanking detachments at all. When this is the case suitable commanding points should be selected on the line of march and small detachments should be left to hold these positions, to protect the column from the loss and disorganization caused by the flank attack of even a small party of the enemy on a force trailing along a narrow path.

Parties thus left in selected positions will be found most useful for covering the march of the baggage especially, and will generally be far more able to repel an attack should one be attempted, than the usual baggage guard marching with the baggage itself.

If the size of the force necessitates its being divided into several columns moving by one road, the flanking parties sent out by the leading column for the protection of their line of march and parties left on the line of march itself to hold important points, will remain in position until relieved by troops from the next brigade or column, or, if not relieved, will remain until the whole force with all the baggage has passed.

Baggage and Baggage Guards.

The baggage of each column should start immediately behind the column, and the baggage of the various units should march in the same order as the units to which they belong are marching in the column. The staff baggage and field hospitals should be in front. A special guard should be told off as baggage guard in addition to details from each unit, for the supervision of the baggage. The baggage guard must be formed into advanced and rear guards and also into several strong detachments. The baggage guard should on no account be distributed in files throughout the line of baggage ; they should never move in smaller parties than sections.

In addition to guarding the baggage from attack, the baggage guard must assist the adjustment of displaced loads and see that no animals or followers leave the line of march. The transport officers of each corps will supervise the baggage of their corps while the whole will be under the order of the Column Transport Officer. The spare animals with each unit will be in rear of the baggage of each unit, while the spare animals of the column will be with the rear guard.

The Attack.

Immediately the scouts of the advanced guard get touch with the enemy, they should send back word to the officer commanding the advanced guard. This officer should proceed at once to the front to reconnoitre. He should order the advance to be continued if in his opinion the enemy are few in number. If however the enemy appear in force, he should order the advanced guard to occupy suitable positions on any knoll or ridge from which a good view can be obtained, and await instructions from the officer commanding the column. The advance guard should on no account open fire on the enemy except in actual self defence or when it may be necessary to give notice to the troops in rear.

The officer commanding the column, on receipt of the information from the front, should halt the column in some suitable place, out of the enemy's fire if possible, and give orders for the rear to close up He should then join the advanced guard and reconnoitre the position of the enemy. Should he come to the conclusion that the enemy is not in force, he should order the advance to be continued, re-enforcing the advanced guard with one or two companies from the leading battalion if more force is requisite to brush the enemy aside. Should the enemy appear to be in force and to be holding a strong position, he should order the officer commanding the leading battalion to take up a suitable position to cover the line of march, to push back the enemy's advanced troops and enable the remainder of the column to form up in safety. For this purpose as many companies as there is space for should be extended, with the remainder in support.

The remainder of the column will in the meanwhile be closing up.

As each battalion arrives it should be directed towards its probable line of advance, in order that there may be as little delay as possible before the attack can commence. The batteries in like manner should be directed at once to the ground from which the best view of the position can be obtained, and from which the most efficacious fire can be brought to bear on the enemy. This position will probably be further in advance and may be occupied by the enemy's advanced troops in which case the battalions already deployed should advance, driving back the enemy's advanced troops, and cover the forward movement of the artillery. At least one third of the infantry should be held in reserve and under cover if possible. All unnecessary delays must be avoided : the troops should move at once to their positions in the line of attack. Even the delays in making preparatory dispositions should be reduced to a minimum, as the enemy will attribute all delays to fear and will be emboldened accordingly. The object should be to impress on the enemy that he is despised, and that the attacking troops are only too glad to get an opportunity to get at close quarters with him. This must not, however, prevent a reserve being invariably kept in hand to meet any unforeseen contingency that may arise, and above all things no precaution must be omitted against surprise.

If the enemy is posted in a very strong position, some delay is unavoidable, and should the position be on the top of a steep range of hills, it is absolutely necessary to reconnoitre the ground very carefully before deciding on a plan of attack. The under features of a hill are very deceptive at a distance, and if reconnaisances are not carefully made, a General may find himself committed to a plan of attack on a strong position which, owing to the difficulty of the ground, may be quite impracticable. Strong parties having been pushed well forward to reconnoitre the position, the plan of attack must be decided on. In attacking a long ridge, the attacking columns will have to ascend the spurs or ridges running down from the main ridge, as the spurs will not be so steep as the valleys between them; a more commanding view is also obtainable from the spurs, and at the same time the attacking columns are safer from rocks, trees &c., which may be hurled down the hill upon them by the enemy.

Positions must be selected from which the artillery can bring an effective fire on the enemy's main position, from where they can also bring a fire on each consecutive point of opposition. It will often be found necessary to move the artillery forward during an attack, to occupy in turn the commanding knolls and under features from which the infantry aided by the artillery have driven the enemy. If the artillery force consists of several batteries they should advance in echelon, if suitable positions can be found. The main principles on which a plan of attack should be made are:—

1. To attack the position in flank or if possible with a turning movement, while the enemy are held in front with a force sufficiently strong to defeat any attempt at a counter attack. A well chosen position cannot be forced in front without a crushing numerical superiority, and then only at a great loss in men on the part of the assailant. The

approaches to a position will, however, often make it impossible to bring this great superiority of numbers against the enemy, and so the assailant will be unable to avail him self of this advantage. The movements of the several columns must be so arranged that they shall arrive at the enemy's position simultaneously. Should the calculations have been faulty, and the columns be unable to communicate with one another, they will be liable to be beaten in detail and the attack will inevitably collapse.

2. To bring as strong a fire as possible on each successive point of resistance by concentrating the artillery, machine gun, and infantry fire on these points. Long range infantry fire should be made use of.

3. To bring the attacking infantry as near to the enemy's position and with as little loss as possible. For this purpose, any formation that maybe best adapted to the object in view and the ground to be traversed, must be adopted

4. To deliver the attack without hesitation. But the advance must not be hurried, as the men's strength must be reserved for the final assault.

5. To make the attack simultaneously along the line. To carry this out successfully, the departures of the several columns must be carefully arranged ; but. with the greatest care, it is almost impossible to estimate time and distance in mountainous countries. In some cases it may be possible for one column to note the progress made by another column. If this is impossible, arrangements should be made to keep up communication with some spot in rear by means of signallers. The Russians in 1878 used a field telegraph wire, with the greatest success, to keep up communication with a widely detached turning movement in a mountainous and difficult country.

6. The leading companies should endeavour, if possible, to advance without firing, because the fire of troops advancing up a steep hill would have little or no effect on the enemy and the firing would only tend to delay the advance. Troops advancing thus to the attack, more or less breathless, however carefully the advance had been made, can hardly be expected to direct their aim with any accuracy at so small a mark as the heads of the enemy crouching low behind their sangars, or firing from roughly made loopholes. The time will be better spent in advancing steadily than in halting to fire at such an inadequate target. The issue of the fight must be decided at close quarters, and with the bayonet if necessary.

The strongest positions are those which have both flanks resting on impassable obstacles ; in this case frontal attacks are necessary. As many columns as possible should be sent against the position, some of them being mere feints to prevent the enemy massing his whole force against the real points of attack. These feints should, however, be sufficiently in force so that they may be converted into real attacks, should the opportunity occur. The result may be often equally well obtained by a turning movement, but as the object in savage warfare is to destroy the enemy's fighting men, very little is gained by such an undertaking. It is generally a tactical success that is required as will as a strategic one.

Infantry in Attack.

The company should be the fighting unit. As many companies should be told off for the firing line as there is room for on the spur or ridge up which the attacking column is to advance.

Each company in the firing line should be followed closely by another company of the same battalion in support. Thus the firing line and support should be of the same strength. In addition to this there should be a strong reserve. Whether the troops were also formed into a second and third line, would depend upon whether the force was available and the nature of the opposition to be expected. It will seldom be necessary to have more than the fighting line supports and reserves.

If the column of attack consisted of three battalions, the normal order of attack would be No. 1 and 2 battalions extend 4 companies each in fighting line, with 4 companies each in support, ana No. 3 battalion in reserve

It is however impossible to lay down a regular attack formation for hill warfare. Each company must be kept intact and the men must be well in hand—no easy matter in difficult mountainous country. The pace must be slow, but steady. No hurrying must be allowed, for men out of breath are useless for repelling a counter charge or delivering an assault The leading companies should advance if possible without firing. They should be followed closely by the support. Previous to the advance, the officer commanding the battalion should clearly explain the object of the attack and the direction it should take. Should a nearer approach to the position make it clear that the attack was moving in a wrong direction, the battalion commander should attract the company commander's attention by means of a whistle, and indicate to him by signs the new direction he wishes the advanced line to take.

The advanced companies should halt occasionally, for short intervals, on marked defensible knolls or ridges, to allow the men to take breath, and that they may not be too fatigued by too rapid and continuous an advance. This is especially necessary if the ascent is steep and long.

The supports should close up on these occasions, take cover in rear of the advanced companies, and be ready to occupy the crest of the knoll as the advanced companies move on. If the contours of the ground admit of it, the supports from this position might cover the advance with an effective fire. There should be no rushing from ridge to ridge and from cover to cover, the advance must be steady and slow. If the firing line are unable to move forward they should be permitted to open fire, but all firing must be kept under perfect control and only volley firing should be allowed. If possible the advanced line should move without firing, their advance being covered by the artillery fire and long range infantry fire whenever practicable, and also by the supports and companies told off from the reserves.

So much however depends on the formation of the ground that nothing definite can be laid down. The pace must also depend on the country and the condition of the men. The line of advance must be kept as intact as possible, and undue separation from supports must be avoided. The supports must be ready at all times to render immediate assistance to the fighting line, and should a fresh impulse be required to induce the fighting line to continue their advance, the supports and even the reserves must be pushed forward into the fighting line. When within 200 or 300 yards of the enemy's position, bayonets should be fixed and the line prepared for a sudden charge of the enemy's swordsmen. This charge should be met by very slow and deliberate individual firing. The superiority of our weapons gives us great advantages over any odds in numbers; and experience proves that, while a steady front will inevitably check a rush of savages, the slightest giving way will surely lead to mischief, if not disaster.

Previous to the assault the supports and if necessary the reserves should close with the fighting line, as the assault must be delivered in force. The men should cheer loudly as they close with the enemy and the bugles should sound the charge.

Immediately the position is carried and the enemy have been driven out, the companies should reform, and either continue in pursuit of the enemy, or open fire on him as he retreats. Every endeavour should be made to turn the retreat into a rout. Should the assault fail and the attacking column be driven back, the officers should try to reform their men at once, either at the first knoll or ridge suitable for defence, or else in rear of the reserves.

Retirements.

Retiring before an enemy is often a more difficult undertaking than advancing against one. The enemy encouraged by the retrograde movement will often do all he can to hamper the movement of the rear guard, and if every precaution is not taken, the enemy's intimate knowledge of country will enable him to cut off detached parties. In retiring over ground which has not been previously traversed, the scouts of the advanced guard must be pushed well to the front in order to give the main body timely notice of any difficult or precipitous places which may be met with on the line of march. If such should be discovered, every endeavour must be made to find as quickly as possible the best line for the coloumn to pursue. As it may sometimes be necessary to make the track passable, one or two mules with entrenching tools should be sent with the advanced guard. Immediately a difficult place is discovered, word should be sent back to the officer commanding the rear guard directing him to hold on to the position he has until the baggage can be got past the obstruction. The enemy aware of the difficulties of the line of march will probably take this oportunity of pressing his attack, in which case the rear guard should be reenforced. If the enemy is very bold, a counter attack will be the most effective way of relieving the pressure, but the troops thus employed must not be allowed to follow the enemy far, if the counter attack is successful.

When a force is about to retire before an enemy, the baggage should first move off under a strong escort, and preceded by a strong advanced guard. This advanced guard should move with all the usual precaution of scouts and flanking parties. The artillery of the force should follow the baggage. A strong rear guard should be left to cover the retrograde movement. This would in most cases be formed from the picquets, re-enforced if necessary. All unnecessary ammunition, mules, entrenching tools &c., should be sent with the baggage. Doolis and riding ponies for wounded men, should be left with the rear guard. Rear guards are often hampered by the difficultfes they encounter in bringing off wounded men who have been hit, after the main body have been moved off.

In retiring from a hill top, the rear guard should occupy commanding positions until the main body are out of range. When the column has got to a safe distance, part of the rear guard should retire and take up another position in rear, their retreat being covered by the fire of the part still in position. When they have taken up a good position from which a good view and field of fire can be obtained, the rear guard should retire behind them to another position, and in like manner successive positions should be occupied on the line of retreat. The party in position should on no account retreat until the party in rear are prepared to cover their retreat by fire if necessary. A bold front must always be shewn towards the enemy. Should the enemy press so hardly on the rear party as to make their retirement difficult, they must be re-enforced and the enemy driven back by a counter attack, if necessary, before the retreat is continued. If the ground is suitable, the retirement should take place in several parties on the principles above described. It will be often possible for the parties that first retire to bring a cross fire on the enemy. If the rear guard appears to be severely pressed, the officer commanding the column should send back re-enforcements, or if this appears unnecessary, he can detail companies to occupy commanding positions on the line of march with orders to hold these positions until the rear guard have passed them, when they would follow as rear guard. When parties are retiring in succession before an enemy the supports must not retire too far, as in mountain warfare supports and reserves must be kept much closer to the fighting line than on ordinary ground.

If the retirement is through a defile, strong flanking parties must protect the flanks of the rear guard and of the column itself. These flanking parties will retire on the principles just explained for the retirement of a force off a hill top, or along a mountain crest.

Care must be taken that the flanking parties leave no commanding ridge or knoll, from which the enemy could injure the rear guard, until the rear guard itself has retired.

In mountain warfare the flanking parties thus hold a somewhat different relative position to the rear guard or advanced guard, to what they do in the plains. In the latter they form a regular fan, while in the former the flanks are pushed forward instead of drawn back.

Whatever happens, a rear guard must not be driven in on the retiring column, and they must also endeavour not to be cut off.

Supply of Ammunition.

The supply of ammunition to troops in action on the hill side or in dense forests, is one of the most difficult operations in mountain warfare. If the troops have not been allowed to waste their ammunition at the earlier stages of the attack, they will have enough to gain the position; but, having gained the position or should they have been beaten, a supply of ammunition must be forthcoming to replenish their empty pouches, or they will be unable to withstand a determined counter attack.

When a general action is anticipated, extra ammunition should be issued to the men to be carried in the haversacks; and the 1st regimental reserve ammunition must keep up with the battalion as long as possible, but in mountain warfare owing to the difficulties of the country this will very often be quite impossible.

When the ammunition mules can no longer accompany the troops, the ammunition boxes should be emptied and distributed to the men. This has the disadvantage of encumbering the men with extra weight just at the time when they are required to move with speed and to climb steep hills. When the new small bore rifle has been issued to all the Indian Army, the supply af ammunition will not be such a difficult question if strict fire discipline is maintained, as the cartridges are so much lighter and many more can be carried by the soldier. It is true that the magazine rifle may encourage men to fire more recklessly and to waste more ammunition than they do at present; but this should not be the case if the officers keep their men well in hand, and allow nothing but steady volleys at long ranges.

Our present ammunition boxes are far from satisfactory. They are difficult to open, and it is more difficult still to unpack the box. The packets are packed in very tight. The 1st reserve should consist of special boxes, the entire lids of which open up and allow the packets to be withdrawn easily. If these packets were packed inside the box in canvas bags containing from ten to fifteen packets each, the distribution of ammunition would be much simplified.

Outposts and Picquets.

On arrival of a column at the place where it is intended to halt or bivouac, the column commander should first satisfy himself that the ground offers fair defensive conditions.

Pending the detailing of the regular picquets, the advanced guard and flanking parties should move to the front and occupy any commanding positions from which an enemy could annoy the troops in camp.

The column commander having decided on the strength of the outposts and the line they will occupy, the troops detailed for the purpose will move forward and occupy the positions assigned to them. It will be sometimes advisable to leave the advanced guard and flanking parties to form the picquets. This would be the case when the bivouac has only been reached just before sunset, and when darkness would set in before the relief could be effected. The regular plan of outposts may be much modified. The picquets, consisting generally of a company or half company to each picquet, would hold all points round the camp. The sentries should invariably be double sentries, and they should be posted with their reliefs close at hand under a non-commissioned officer. The sentries should be so posted that they can see and hear without being seen; they may be permitted to sit down if their object can be better obtained by their doing so. The picquets and sentries should build themselves sangars to enable them to offer serious resistance should they be attacked. Every man on picquet duty should have his post assigned to him, and all the men should clearly understand their duties in case of an attack. They should be acquainted with the positions of the camp and of the picquet immediately adjacent, as well as the direction of the enemy. No firing should be allowed at night unless the enemy really attack the picquets' position, and, even then, the bayonet must be chiefly trusted to beat off the attack. The picquet must on no consideration fall back: they must be prepared to sell their lives dearly if necessary, and trust to their comrades sending them reenforcements. Hill men frequently try to draw fire at night by firing on the camp and bivouacs, with the object of harassing and annoying the troops. No notice should be taken of this desultory fire. It may sometimes answer to send a few specially selected men to stalk them, but all the picquets must be warned before they set out. Once the enemy discover that they in turn are being stalked, they will discontinue this annoying practice, and the bivouacs will be left at peace. One or two signallers with lamps should accompany each picquet in order to keep up communication with the camp and with the neighbouring picquets.

When the column moves off in the morning, the picquets must remain where they are until the last man or animal leaves camp; they will then follow in rear as a rear guard, or rejoin their regiment at the first opportunity and as they may be ordered.

Camp and Bivouacs.

Having reached the site for the camp or bivouac, the officer commanding the column will detail the picquets and the positions of the various units in the camp. Alarm quarters must be told off, and arrangements made to preserve the camp and water supply in a sanitary condition.

If the camp is liable to attack on all sides, the transport animals should be placed as much as as possible in the centre, and the infantry encamped round them. Each corps should be given a section of the camp to guard, and it is generally advisable for the corps thus camped to provide the picquets in their front. The supply of food and water to the picquets is thus rendered easier, and, in case of attack, the officer commanding a battalion would be able to re-enforce his picquets, if necessary. Inlying picquets should be told off for each flank of the camp, and these should invariably make their positions secure from attack by building sangars &c.

Sentries should be posted over the water supply, and every effort should be made to prevent the drinking water being polluted.

Latrines must be established within the line of picquets, and at night temporary latrines must be made within the line of sentries.

Jungle Fighting.

In jungle fighting disciplined troops have to contend with the serious disadvantages of having to move through thick bush in single file, —bush probably so thick as to make the duties of flanking parties impossible,—and also to fight with an unseen enemy posted behind strong stockades.

A column moving through thick jungle should be formed into the usual advanced guard, main body, and rear guard. The advanced guard should consist of selected men, quick of hearing, and keen of eyesight.

The "point" should consist of four men under a non-commissioned officer. They should be followed at a distance of from 50 to 100 yards by the remainder of the leading half company. Whenever possible, flanking parties should move on each side of the path, but the density of the undergrowth will often render this impossible. The other half company should follow at about 100 yards in rear, and again 200 yards in rear of them the main body. Should the "point" be fired on, the advanced guard should dash forward without firing, and endeavour to close with the enemy, fixing bayonets as they advance. The enemy's usual tactics are to fire from behind a stockade, and then to bolt. If he finds the troops halt and hesitate, he will probably reload andbe ready to receive them with another volley. Fire should not be opened unless the advanced guard fail to force the path. If the advanced guard fail to force the obstacle, they should seek cover, and either await reenforcement or open fire on the stockade. To fire blindly into a dense undergrowth is however useless. The commander of the column should direct one or more companies to either flank, to turn the obstacle if possible. Once their flank is threatened, the enemy will consider it time to retire, unless they are really in force; in which case, the stockade will probably extend to a considable distance to either side of the pathway. If the troops detached to the flanks find the stockade is too long to be turned, they should dash at it with a cheer, and endeavour to force an entrance somehow; at the same time the advanced guard, reenforced, should again try to break through the obstacle. Most savages will hold their ground behind a stockade for ever if the attacking force content themselves with firing at them from behind rocks and trees, but they know better than to wait when they see well armed and disciplined troops rushing in on them. It is impossible to lay down any formation for the actual assault. Officers must lead off their companies in the direction they are ordered, force their way through the jungle, cutting a path if necessary, and, when close up, they should rush at the obstacle with fixed bayonets.

It the ground permits it, the company should be extended previous to delivering the attack. The Gurkha·kookri is a most useful weapon for clearing a jungle path, and it would be well if all troops working in thick jungles were supplied with something of the sort.

Mounted infantry is an invaluable adjunct to any force working in jungles, provided the undergrowth is not too thick. They are admirable for all scouting and advanced guard duties, and can be used with great effect in cutting off the retreating enemy after a successful engagement and in carrying on the pursuit. As, however, their use is more general in countries which can hardly be considered mountainous, it seems out of place to enter more fully into their duties here.

Mountain artillery either carried on mules or coolies, is more useful in mountanous jungles than on the level. The wild tribes in Burma are very much addicted to placing their stockades in positions such as cliffs &c., from which they can bring a heavy fire on the line of march, and from which they cannot possibly be turned out by infantry, without the attacking force making a wide detour for the purpose. In such case a shell dropped into the stockade will often have the desired effect of driving off the enemy and enabling the column to proceed in peace. In jungle warfare modern artillery and rifles lose their superiority as ranges are always short, there is therefore no necessity to have the heavy screw gun, the old fashioned 200 pound gun being all that is really required.

On the line of march the troops must keep well together; the pace must be slow, and there must be continual halts to allow the rear to close up.

If the road is likely to be required as the main line of communication, arrangements should be made to clear the brushwood from each side of the path; even if only a few feet are cleared.

When camping in a forest, it is necessary to clear round the camp as much as possible. This will often be very difficult to do, and sometimes impossible. A fairly open place should be selected as near to water as possible. Sentries should be posted round the clearing, and inlying picquets should be told off. The sentries should be protected by abattis, formed by the brushwood cut down in clearing the ground for a bivouac or camp. All troops should be told off to alarm posts. Sentries should invariably be double. The transport coolies and animals should be placed in the centre of the bivouac.

In the Irrawaddy column under Major Yule, employed against the Kachins in 1892, the form of camp adopted was an oblong Zariba as shown in the accompanying sketch. Its advantages are—

1. If attacked, every man is in position, by merely turning outwards in his shelter, to use his rifle, without any possible danger of hitting any body in camp.

2. The guns, mules, stores, &c., are protected by an uninterrupted line of infantry.

3. The men during the day can cook and move freely about outside their shelters, by the construction of which they are naturally prevented from obstructing the interior of the camp.

4. It is the best suited to withstand or prevent surprise.

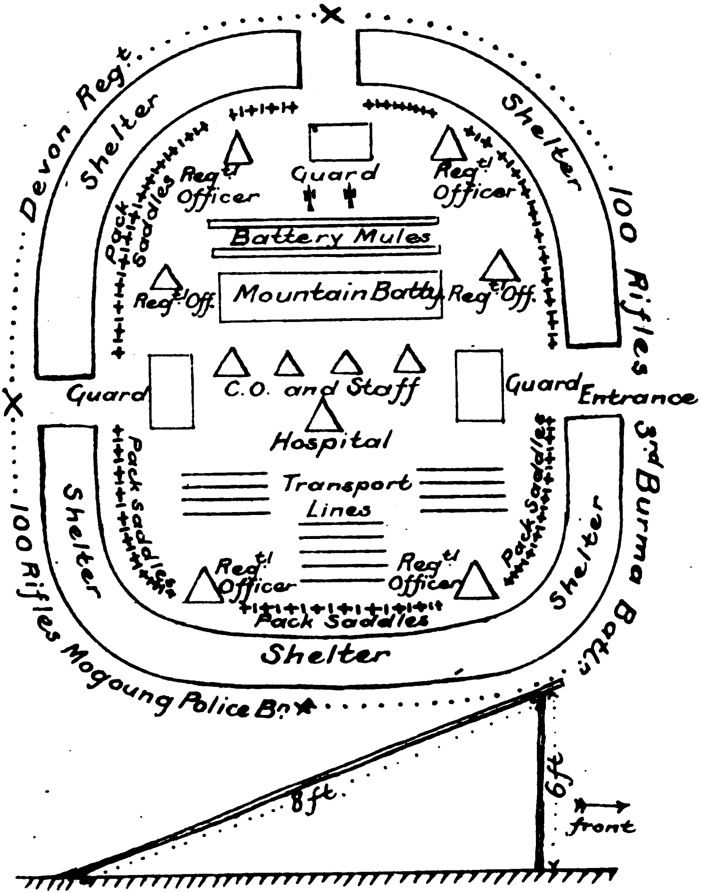
5. The sentries placed round outside at night gain confidence by knowing the exact position of the troops, for, after a few days, every man become perfectly familiar with the arrangement.

Followers.

The curse of our Indian armies is the multitude of followers without whom it is considered impossible to move a force in the field. The number that are allowed at present are as nothing compared with the myriads that were considered absolutely necessary only a few years ago. Every endeavour has been made to reduce to a minimum this multitude of unarmed defenceless creatures who follow our armies, but how much yet remains to be done must be clear to any one who believes with Lord Wolseley that a British soldier is not an exotic that must be tended like a sickly school girl, and that he does not require a rum ration daily, nor tents, nor native servants to wait on him, and that he is able to rough it and bear the fatigues inseparable from hill warfare.

NOTES ON MOUNTAIN WARFARE.

Plan of Camp or bivouac suitable for a small force in Mountain Warfare in the Jungle, as used by the Irrawaddy Column in the Kachin Hills in 1892.



There are many followers such as dooli bearers, bhistis, banias, sweepers &c., who from the nature of their duties or the class from which they are necessarily enlisted, are quite incapable of being trained to arms, but there are many others who only require to be trained to arms to become efficient troops well capable of holding their own on the line of march, or in defending a post; instead of requiring protection from regular troops they could protect themselves, and on emergencies they could even protect others. They naturally would not be used for offensive action. The followers who could with advantage be trained to arms are:—

1. Transport followers.
2. Khalassies.
3. Lascars.
4. Telegraph coolies, linesmen &c.

Lieut. Barrow, in his Prize Essay 1880, brings prominently forward the advantages that would accrue to an Indian army if every follower was trained to arms, and that, whether dooli bearer or transport driver, he should carry a short "carbine to be slung on the back," and that he should be put through an annual course of musketry.

It is not supposed for a moment that all the *present* transport followers could be trained to arms. The present conditions of the service are not such as to encourage good men to enter. It is not the transport drivers as we now know them that could be trained, but the men that would enlist, if only they were paid and fed as combatants. As long as they are treated as mere followers, untrained, uncared for, badly paid and under rationed, it would be hopeless to attempt to give them a military training The status of the transport driver should be raised to that of an artillery driver, and they should be organized in corps, properly clothed, equipped, and armed.

The duties of tindals, khalassies, lascars, cooks &c, could with great advantage be performed by sepoys; and there appears no necessity whatever to continue to enlist these men. If commanding officers were consulted they would probably be unanimous in preferring an extra havildar to a tindal, and in like manner extra sepoys in places of khalassies &c. With a view to reducing dooli bearers to the lowest possible number, the field hospitals have been provided with riding mules and ponies for the conveyance of the sick and wounded This is a step in the right direction. All hospital servants should be sepoys with the exception of those noted above, whose duties or class render this impossible.

The telegraph department bring a large number of non-combatants into the field. If regular telegraph companies were formed, there would be no necessity for all the unarmed men who are now required to lay a telegraph line.

There are also many posts in the commissariat department that could be filled by sepoys—if only the right men were enlisted and trained in times of peace.

Telegraphy.

In the Indian Army there are no field telegraph companies, and with the civil telegraph department ably worked by well trained officers as it has been in the past, there appears no necessity for the introduction of regular permanent telegraph units; but something ought to be done to reduce the number of unarmed followers, linesmen, coolies &c., who now accompany the department on field service.

When frontier expeditions take place, the Government telegraph lines are extended to the base of operations in a more or less permanent manner, and, as the troops advance, a further extension of the line is made, either by means of an insulated wire laid on the ground, or else by wire carried on temporary posts, the line being continued so as to keep the head quarter camp in connection with the telegraph system of India.

No attempt has yet been made to use either telegraph or telephone in the field in a tactical manner, or even to connect the various columns of a force operating in the same theatre of war.

The reason that telegraphy has been so much neglected, is partly owing to the expense connected with its introduction, the amount of carriage required, and the difficulties of conveying large quantities of insulated wire over mountain tracks, and partly to the climate which enables visual signalling to be employed with such marked success.

The Indian telegraph department have always shewn themselves capable of doing the work that is required of them, and, as long as this is so, there is evidently no necessity for introducing regular telegraph companies with their more expensive and elaborate equipment, although there are many occasions when such a company might be of the greatest assistance.

By giving the home telegraph companies however, an occasional tour of India service, valuable experience might be gained, or the Bengal Sappers and Miners might raise a few companies for this work.

The chief objection to the present system is the number of non-combatants that accompany the telegraph department. Some organization should therefore be devised by which the numbers could be reduced to a minimum. Field equipment is already in use by the telegraph department, and all that is required is a more purely military organization. The telegraph department could form several service companies from among their employées, something on the lines of a volunteer company, preference being given to able bodied men and those who were of good physique and had previous service in the native army and police.

There are already a large number of British soldiers in the department who are now used as telegraph signallers on service. The officers of these companies should be selected from either the military or civil officers of the department: if from the latter, they should receive volunteer commissions, or commissions in the Reserve of Officers, and be encouraged to perfect themselves in military training.

The non-commissioned officers and men should be armed and equipped as infantry soldiers.

Signalling.

Visual signalling assumes a more than usual importance in hill warfare. It is almost impossible to estimate the advantages that have accrued to our armies in the field, especially to a force working in a mountainous district, by the introduction of the heliograph and the lamp. With them easy and rapid communication is kept up between the various detached parts of a force by day and night, and combinations are now easy which without signalling would be dangerous if not impossible. Hill warfare in India generally consists of a struggle between the opponents for the possession of the crest of a mountain range, and from these commanding positions the signallers can use their appliances with effect.

The telegraph affords an army more regular and rapid communication, but at the same time it offers to the enemy a continuous line for attack, and hill tribes have always shewn sufficient intelligence to intercept the communications by cutting the wire.

Visual signalling affords on the contrary no such extended line for attack; its points are few and far between, and are generally so situated as to be easy of defence. Visual signalling has the further advantage of enabling those employing it to signal messages across country occupied by an enemy, without the enemy being able to prevent it. For communication with a beleaguered post, or for the purpose of enabling two commanders to combine for a common attack on an enemy in superior force between them, this advantage is invaluable.

In a very able article on army signalling in the Journal of the U. S. I. of India for August 1892, Captain Hamilton, Inspector of Army Signalling has laid down the lines on which the signallers in the Indian army are at present organized. Captain Hamilton endeavours to make the most of the regimental system now in vogue, but it is easy to see that he would prefer a corps of signallers specially raised for the work.

Camp equipage.

The smallest size tents only should be taken on mountain campaigns. If the tents are large it is difficult to find level places to pitch them on, and the excavation of a suitable spot often entails a great deal of unnecessary labour on a soldier already worn out by a hard days' march. The 160 lbs. general service tent is too large, and the reason for retaining it is not apparent. The present 80 lbs. general service tent is an admirable one in every respect. It is compact, handy, easily pitched, and two of them make an excellent mule load, and on a hill side it is generally easy to find a piece of ground to pitch it on.

Owing to the difficulties of transport, troops will in future probably have to move without tents, but this should be avoided if possible as the exposure to heat and cold, snow and rain, which the want of camp equipage entails, will soon increase the sick list. To obviate this the introduction of some kind of *tente d'abri* appears most necessary. At present the men are provided with a waterproof sheet which is intended to act the double purpose of protecting a man's kit on the line of march and being used as a ground sheet for the men to sleep on. If the waterproof sheet were only used for these two purposes as its designers evidently intended, there would be nothing to be said against it; but as a matter of fact it is seldom if ever used as a ground sheet, troops experienced in bivouacing preferring a cover over them to keep off rain and heavy dew to a ground sheet under them. The waterproof sheet does not well adapt itself to this use, it is likewise very heavy. The men endeavour with some success to tie several sheets together and thus form a kind of *tente d'abri*, but these makeshift arrangements do not keep out the rain in the way a sheet designed for use as a *tente d'abri* would. A far more suitable article could be made from khaki drill soaked in a waterproof mixture and so shaped that any two sheets would form a complete tent, large enough for three men to sleep in with comfort, the third man's sheet being used as a ground sheet. The advantages that would accrue to a force in the matter of health and comfort were a tent of this description introduced, would be considerable. A General would not feel so tied down as at present if the ever pressing necessity of providing carriage for the general service tents

The weight of these small tents would be less than the present waterproof sheet.

Transport.

The efficiency of any force campaigning in the hills depends so much on the transport service with the army that the question of the best organization suitable for mountain warfare is one of special interest. Unfortunately the question of expense enters so largely into any scheme for the improvement of our transport that the authorities are unable to do what they would in the matter. A great deal has been done in the last few years, but there is still much to be done. The nature of the country in which our campaigns usually take place is so different from that experienced by Europeon armies that no comparison of schemes is possible.

The Germans estimate that a force of 35,000 men and 10,000 horses can subsist for one day, on a front of 5 miles and a depth of 9 miles, on country produce alone, while the Indian Commissariat would have to import the whole of the stores required, owing to the poverty of the country and the absence of supplies. Although they may be able to collect a small quantity of corn and grass, they must not count on it, and must be prepared to supply every thing even down to fodder for the transport mules. It will readily be seen how important a duty the transport department have to perform.

The various means of transport at the disposal of an army in India are too well known to need recapitulation. Carts, camels, mules, ponies and coolies, have each their advantages and disadvantages, and the employment of one or the other must necessarily depends on circumstances. Without going into details, a few notes on this subject may be given before concluding this paper.

Carts.—Mule carts have not been so much used as they might have been. On the line of march they would be invaluable in assisting the concentration of a force. A mule can draw from 8 to 12 maunds in a good cart on a good road, while it can only carrry from 2 to 3 maunds.

The extra carrying power gained by a regular use of mule carts would make the rapid concentration of a force much easier than it is at present. A regiment moving with its normal scale of pack animals, would be able to bring up its own reserve supplies and ammunition to the base of operations, or even further, if the roads were not too bad for mule carriage.

Those who have had no personal experience of mule carts on bad roads, would be astonished at the weight a small mule can drag, provided a few extra mules are available to hook on at particularly bad places. The escort can also lend a hand when necessary.

Camels.—The camel although a most excellent transport animal in the plains, can hardly be considered suitable for mountain warfare. It is true they are used on mountain roads, but they are not in their proper place, and no force equipped with camel transport can be considered really mobile. For use on the line of communication they are however invaluable.

Mules.—The mule is the best of all transport animals, and on the efficiency of the mule transport the mobility af an Indian army depends.

The present system of linking three mules together is indefensible and has probably arisen from the conditions of the service which allow only one driver to every three mules. The transport mule should be trained to go in droves. This system has been tried on service and also in cantonments, and has been found to work very well. The only drawback to the system is that under the present arrangement one driver is responsible for three mules. Now unless these three mules are tied together it is very apparent that the driver will be unable to keep them together. A good mule will gradually work his way to the front, while a weak mule will gradually fall to the rear. The driver unable to be in three places at once finally loses one or other of his mules. The drivers therefore evade the order to let their mules go singly whenever they possibly can, and link their three mules together. The result is most disastrous to the animals concerned, no two mules walk the same pace exactly and their loads may be of different weights, and in negotiating bad places the leading mule pulls the remaining two mules over any how, with the result that the loads are disarranged and the mules backs rubbed.

The regulation allowance of one driver to every three mules is not sufficient. On service this number dwindles down until sometimes one driver has to look after four or even five mules. No driver can properly look after more than two mules, and the French consider even this impracticable. They consider that one mule is as much as one man can look after with safety, and that " the advantage of retaining a few bayonets in the ranks is not commensurate with the loss of ammunition, provisions, baggage, and animals, which an insufficient number of drivers entails."

Ponies.—Ponies have very much the same characteristics as mules. They are not quite so hardy, nor clever in bad ground. They were used generally in Burma in lieu of mules and answered well. They should be organized exactly in the same manner as mule transport.

Coolies.—Coolie transport would only be used when the roads are so bad as to make the use of pack animals impossible. They are organized in corps raised for a special purpose. Their loads will depend on the country traversed, and the race of men from which the corps are enlisted. In any case coolie transport is the most expensive and unsatisfactory of all, and happy is the commander who is able to dispense with it entirely.

the men should clearly understand their duties in case of an attack. They should be acquainted with the positions of the camp and of the picquet immediately adjacent, as well as the direction of the enemy. No firing should be allowed at night unless the enemy really attack the picquets' position, and, even then, the bayonet must be chiefly trusted to beat off the attack. The picquet musts on no consideration fall back; they must be prepared to sell their lives dearly if necessary, and trust to their comrades sending them reenforcements. Hill men frequently try to draw fire at night by firing on the camp and bivouacs, with the object of harassing and annoying the troops. No notice should be taken of this desultory fire. It may sometimes answer to send a few specially selected men to stalk them, but all the picquets must be warned before they set out. Once the enemy discover that they in turn are being stalked, they will discontinue this annoying practice, and the bivouacs will be left at peace. One or two signallers with lamps should accompany each picquet in order to keep up communication with the camp and with the neighbouring picquets.

When the column moves off in the morning, the picquets must remain where they are until the last man or animal leaves camp; they will then follow in rear as a rear guard, or rejoin their regiment at the first opportunity and as they may be ordered.

Camp and Bivouacs.

Having reached the site for the camp or bivouac, the officer commanding the column will detail the picquets and the positions of the various units in the camp. Alarm quarters must be told off, and arrangements made to preserve the camp and water supply in a sanitary condition.

If the camp is liable to attack on all sides, the transport animals should be placed as much as as possible in the centre, and the infantry encamped round them. Each corps should be given a section of the camp to guard, and it is generally advisable for the corps thus camped to provide the picquets in their front. The supply of food and water to the picquets is thus rendered easier, and, in case of attack, the officer commanding a battalion would be able to re-enforce his picquets, if necessary. Inlying picquets should be told off for each flank of the camp, and these should invariably make their positions secure from attack by building sangars &c.

Sentries should be posted over the water supply, and every effort should be made to prevent the drinking water being polluted.

Latrines must be established within the line of picquets, and at night temporary latrines must be made within the line of sentries.

Jungle Fighting.

In jungle fighting disciplined troops have to contend with the serious disadvantages of having to move through thick bush in single file,—bush probably so thick as to make the duties of flanking parties impossible,—and also to fight with an unseen enemy posted behind strong stockades.

A column moving through thick jungle should be formed into the usual advanced guard, main body, and rear guard. The advanced guard should consist of selected men, quick of hearing, and keen of eyesight.

The "point" should consist of four men under a non-commissioned officer. They should be followed at a distance of from 50 to 100 yards by the remainder of the leading half company. Whenever possible, flanking parties should move on each side of the path, but the density of the undergrowth will often render this impossible. The other half company should follow at about 100 yards in rear, and again 200 yards in rear of them the main body. Should the "point" be fired on, the advanced guard should dash forward without firing, and endeavour to close with the enemy, fixing bayonets as they advance. The enemy's usual tactics are to fire from behind a stockade, and then to bolt. If he finds the troops halt and hesitate, he will probably reload andbe ready to receive them with another volley. Fire should not be opened unless the advanced guard fail to force the path. If the advanced guard fail to force the obstacle, they should seek cover, and either await reenforcement or open fire on the stockade. To fire blindly into a dense undergrowth is however useless. The commander of the column should direct one or more companies to either flank, to turn the obstacle if possible. Once their flank is threatened, the enemy will consider it time to retire, unless they are really in force; in which case, the stockade will probably extend to a considable distance to either side of the pathway. If the troops detached to the flanks find the stockade is too long to be turned, they should dash at it with a cheer, and endeavour to force an entrance somehow; at the same time the advanced guard, reenforced, should again try to break through the obstacle. Most savages will hold their ground behind a stockade for ever if the attacking force content themselves with firing at them from behind rocks and trees, but they know better than to wait when they see well armed and disciplined troops rushing in on them. It is impossible to lay down any formation for the actual assault. Officers must lead off their companies in the direction they are ordered, force their way through the jungle, cutting a path if necessary, and, when close up, they should rush at the obstacle with fixed bayonets.

If the ground permits it, the company should be extended previous to delivering the attack. The Gurkha-kookri is a most useful weapon for clearing a jungle path, and it would be well if all troops working in thick jungles were supplied with something of the sort.

Mounted infantry is an invaluable adjunct to any force working in jungles, provided the undergrowth is not too thick. They are admirable for all scouting and advanced guard duties, and can be used with great effect in cutting off the retreating enemy after a successful engagement and in carrying on the pursuit. As, however, their use is more general in countries which can hardly be considered mountainous, it seems out of place to enter more fully into their duties here.

Mountain artillery either carried on mules or coolies, is more useful in mountanous jungles than on the level. The wild tribes in Burma are very much addicted to placing their stockades in positions such as cliffs &c., from which they can bring a heavy fire on the line of march, and from which they cannot possibly be turned out by infantry, without the attacking force making a wide detour for the purpose. In such case a shell dropped into the stockade will often have the desired effect of driving off the enemy and enabling the column to proceed in peace. In jungle warfare modern artillery and rifles lose their superiority as ranges are always short, there is therefore no necessity to have the heavy screw gun, the old fashioned 200 pound gun being all that is really required.

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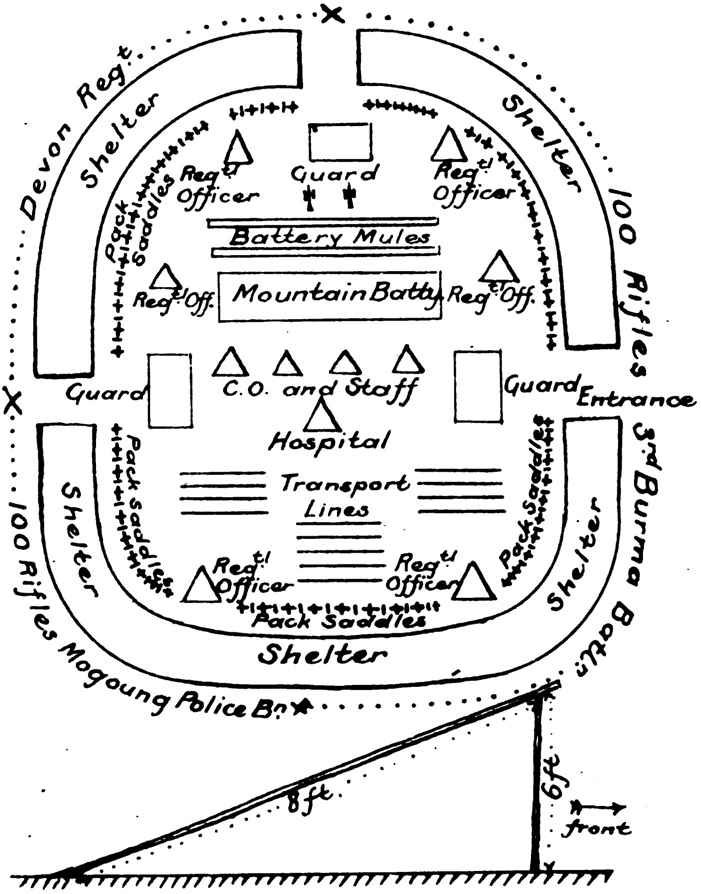

Section of a Shelter

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Camp equipage.

The smallest size tents only should be taken on mountain campaigns. If the tents are large it is difficult to find level places to pitch them on, and the excavation of a suitable spot often entails a great deal of unnecessary labour on a soldier already worn out by a hard days' march. The 160 lbs. general service tent is too large, and the reason for retaining it is not apparent. The present 80 lbs. general service tent is an admirable one in every respect. It is compact, handy, easily pitched, and two of them make an excellent mule load, and on a hill side it is generally easy to find a piece of ground to pitch it on.

Owing to the difficulties of transport, troops will in future probably have to move without tents, but this should be avoided if possible as the exposure to heat and cold, snow and rain, which the want of camp equipage entails, will soon increase the sick list. To obviate this the introduction of some kind of *tente d'abri* appears most necessary. At present the men are provided with a waterproof sheet which is intended to act the double purpose of protecting a man's kit on the line of march and being used as a ground sheet for the men to sleep on. If the waterproof sheet were only used for these two purposes as its designers evidently intended, there would be nothing to be said against it; but as a matter of fact it is seldom if ever used as a ground sheet, troops experienced in bivouacing preferring a cover over them to keep off rain and heavy dew to a ground sheet under them. The waterproof sheet does not well adapt itself to this use, it is likewise

Shrapnel, originally a British invention, at first made its way somewhat slowly in continental armies, but at the present day its use and development abroad may wisely be assumed to equal the effectiveness of our own shrapnel.

Smokeless powder will give some slight extra concealment to both sides from counter observation, while generally increasing the accuracy and rapidity of artillery fire by the removal of the obscuration of the smoke.

Formerly, in artilley duels, the guns themselves suffered comparatively little loss. Great losses have usually been in men and horses, and these have compelled the withdrawal of the guns, usually uninjured.

With high explosives it will be more common for the guns themselves to be destroyed or disabled, and this perhaps will somewhat shorten the artillery duel, and render infantry action possible at an earlier stage.

It may be possible to overrate the power of modern artillery as well as to underrate it, or fail to calculate the advances made in that arm.

One writer anticipates that in the next war we shall see half an army corps put out of action in a short time, by the fire of artillery alone.

Another more moderate exponent says "Sceptics as to the power of modern artillery would be at once converted could they see 100 guns in one line, under one control, occupying a frontage of one mile and distributing their fire as required to every point in the field, varying the nature and object of the massed fire as the controlling head may direct.

It is some such concentrated and increasingly powerful effect which may now be expected from an opponent's artillery and it would seem, therefore, that the protection afforded by walls, buildings, and revetted works, will specially need revision as adjuncts to field defence. Earthwork &c. admits of easier modification to present conditions by adapting it to the scale of penetration (as far as time will allow of such greatly increased labour) but cover actually standing, will always be useful provided it still affords a protection and does not add to the destructive effects of fire.

For instance a house or high brick wall of 1½ brick thickness now becomes worse than no shelter at all, *if its occupation be known to the enemy*, for it is evident that under modern shell fire the effects of a bursting shell are doubled by the flying fragments of masonry, crumbling roofs and falling beams adding to the confusion and alarm.

See Fig 1.

It would even appear that common shell charged with high explosives requires weak cover to develop its full effect, for it is said to be less destructive to infantry in the open than is shrapnel.

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a church, its walls will conti
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Those who have had no personal experience of mule carts on bad roads, would be astonished at the weight a small mule can drag, provided a few extra mules are available to hook on at particularly bad places. The escort can also lend a hand when necessary.

Camels.—The camel although a most excellent transport animal in the plains, can hardly be considered suitable for mountain warfare. It is true they are used on mountain roads, but they are not in their proper place, and no force equipped with camel transport can be considered really mobile. For use on the line of communication they are however invaluable.

Mules.—The mule is the best of all transport animals, and on the efficiency of the mule transport the mobility af an Indian army depends.

The present system of linking three mules together is indefensible and has probably arisen from the conditions of the service which allow only one driver to every three mules. The transport mule should be trained to go in droves. This system has been tried on service and also in cantonments, and has been found to work very well. The only drawback to the system is that under the present arrangement one driver is responsible for three mules. Now unless these three mules are tied together it is very apparent that the driver will be unable to keep them together. A good mule will gradually work his way to the front, while a weak mule will gradually fall to the rear. The driver unable to be in three places at once finally loses one or other of his mules. The drivers therefore evade the order to let their mules go singly whenever they possibly can, and link their three mules together. The result is most disastrous to the animals concerned, no two mules walk the same pace exactly and their loads may be of different weights, and in negotiating bad places the leading mule pulls the remaining two mules over any how, with the result that the loads are disarranged and the mules backs rubbed.

The regulation allowance of one driver to every three mules is not sufficient. On service this number dwindles down until sometimes one driver has to look after four or even five mules. No driver can properly look after more than two mules, and the French consider even this impracticable. They consider that one mule is as much as one man can look after with safety, and that " the advantage of retaining a few bayonets in the ranks is not commensurate with the loss of ammunition, provisions, baggage, and animals, which an insufficient number of drivers entails."

Ponies.—Ponies have very much the same characteristics as mules. They are not quite so hardy, nor clever in bad ground. They were used generally in Burma in lieu of mules and answered well. They should be organized exactly in the same manner as mule transport.

Coolies.—Coolie transport would only be used when the roads are so bad as to make the use of pack animals impossible. They are organized in corps raised for a special purpose. Their loads will depend on the country traversed, and the race of men from which the corps are enlisted. In any case coolie transport is the most expensive and unsatisfactory of all, and happy is the commander who is able to dispense with it entirely.

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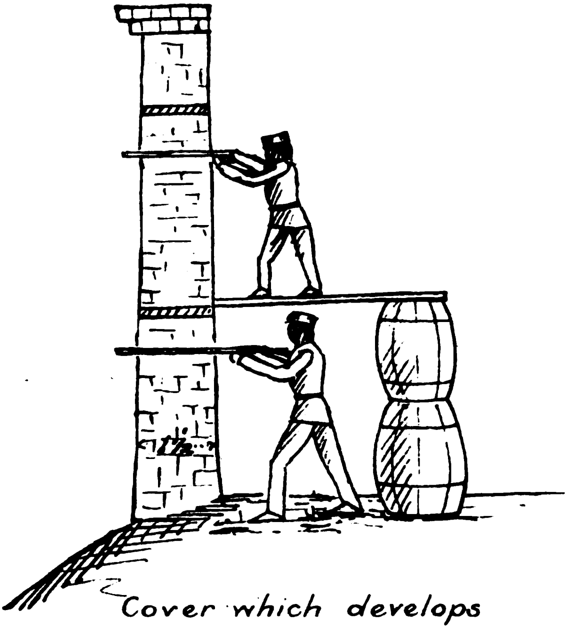
On the other hand where a building is of the average strength of a church, its walls will continue to afford protection to the inmates from field artillery, and hence classification becomes increasingly necessary.

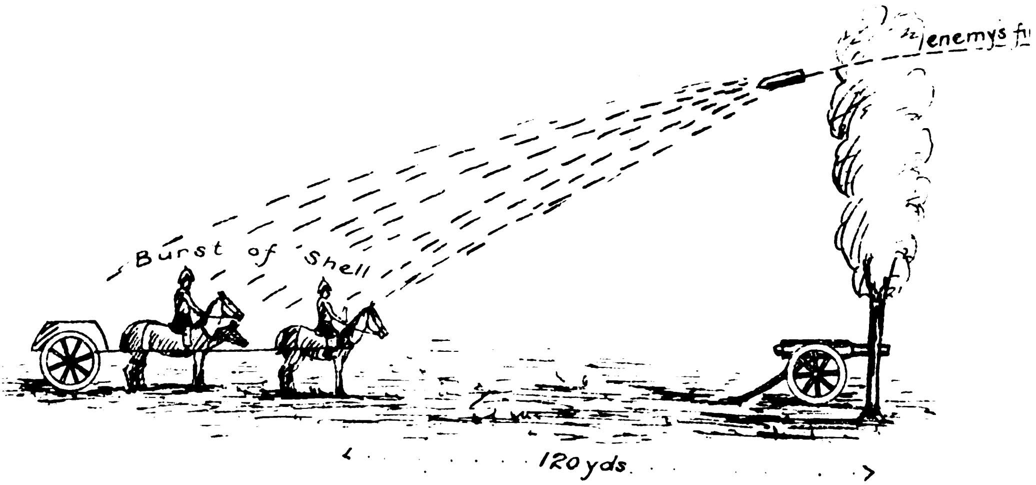
But while the direct lining of thin walls by artillery and infantry would now seem to be worse than no protection, it does not follow that even weak walls and houses offer no protection in any posi-

Fig. 1.



Cover which develops the effect of Artillery fire.

Fig. 2.



tion. On the contrary they would still protect sensibly the flank of any troops at some slight distance from them, and even if easily demolished would require time and expenditure of ammunition to destroy before the flank became again vulnerable.

It is also probable that a house once reduced to a heap of débris, would then become more tenable by infantry as a heap than it was before as a shell trap.

This again leads us to the question whether it is now always worth our while to level all houses around a defensive position, since by so doing the demolished houses might give better cover to the enemy than they did when standing ?

As regards the tactical utilisation of standing houses and high weak walls by advancing artillery, it would sometimes appear feasible to interpose such between themselves and a hostile battery, still keeping their immediate front clear for fire on the enemy's infantry or other detailed objective; but the protection must be carefully thought out, or it may prove delusive.

See Fig 2.

In 1870 a French battery of horse artillery was engaged after selecting as a position, a line of poplars the thick trunks of which afforded at their bases good cover for the gunners ; but after an interval the enemy's shells (fired with percussion fuzes) were found to have nearly exterminated the limbers and waggons to the rear.

This was of course due to the shells bursting on contact with the boughs of the poplars, and from thence the splinters ranged well for the teams and waggons as they were placed. This is an instance of very defective cover which would often require careful watching to avoid.

Such an effect might as easily be reaped from the ridge of a high pitched roof or any penetrable screen which just bursts a shell conveniently for the enemy, and it would appear that officers should avoid halting troops 100 to 150 yards in rear of any screen that will just serve to burst a shell.

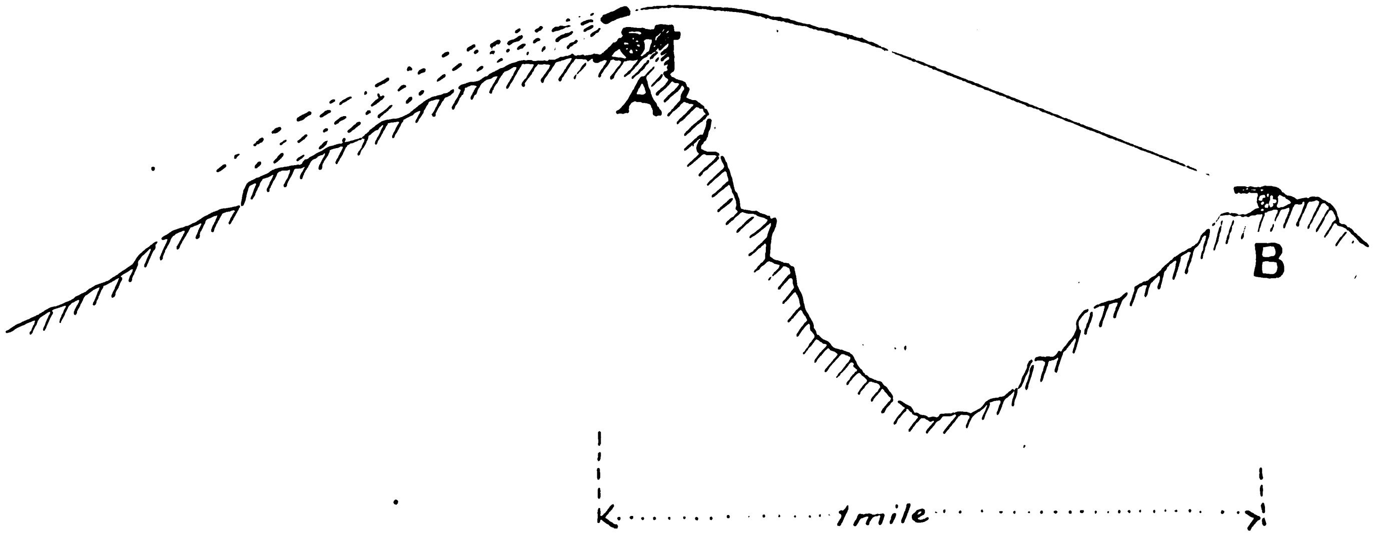
Forests.

Again it is probable that the occupation of the *lisiere* or border of a thick wood would now be a most delusive protection from artillery fire as falling limbs and branches would largely multiply the ordinary effects of shell fire on the supports and reserves in the wood behind.

The whole question of forest defence appears to be one little studied or provided for in the British service. In this matter as in other defensive works we are apt to assume lightly that troops can easily perform individual tasks which are in reality immense.

It is often recommended to form clearances which would involve felling many acres of forest, and though guncotton necklaces might be partially employed, the majority of the trees would have to be felled by the axe. Our British battalions have few axes and little practice in their use, and the work would probably disappoint expectation. Canadian or Australian lumbermen or backwoodsmen would give an excellent result, but it would be useless to expect much skill at the axe from a young British battalion raised perhaps from a midland town and

Fig. 4.



howitzers, guns stronger than ordinary field or even position artillery.

Besides the weight of such guns themselves, increased power in shells means increased difficulty in transport, and the heavier natures of ordnance may have to be abandoned if the subsequent campaign becomes one af march and manœuvre.

Such conditions will react on "cover" and affect its use.

Hitherto high explosives have not been considered absolutely safe in transport, though they were both carried and used by the French mountain artillery in the Madagascar campaign with absolutely shattering effect against the Malagasy positions, which were hastily abandoned under such novel stress, a stress which will prove trying to far more seasoned troops than the Hovas.

Slopes.

Probably one of the most delusive forms of protection that seems to offer itself is the reverse slope of a hill. Such a slope often coincides with a falling trajectory and adds to the loss sustained, although from the reverse slope the enemy is invisible, and it would in the old days have been held to be defiladed from him.

See Fig 4

Such a case occurred at the action of Tashkessen which I propose to notice later, on other grounds.

A Turkish battery at A was engaged with a Russian at B and suffered the most of the two. The Russian trajectory searched the higher position, and the Turkish fire was plunging and therefore little destructive, yet by general rule the Turkish position was "defiladed" and the Russian position absurd. In practice General Baker was surprised to find the results entirely contrary to his expectation.

Head Cover.

The enemy's artillery may be supposed to be in action at many and varying ranges giving varying falling trajectories, and as howitzers have a steeper falling trajectory than ordinary field guns, a slope which protects from one given fire, may be searched by another, and general opinion now seems to point to the impossibility of providing *in the field* head cover of sufficient strength to resist common shell with high explosives, if indeed such cover would not add to its destructiveness.

Earthworks with increased thicknesses will give the same protection as before. Some authorities desire to double the thickness, in order that a single shell may not sweep away the whole cover at any particular point. Others abandon the contest and desire only lighter cover to resist infantry fire and shrapnel.

Soil.

As regards natures of soil, while clay or hard soil can be blown away by shells in pieces, light soils or sand are less destructible, as shells bury themselves therein, and, even if they explode, form a temporary crater into which much of the expelled sand falls back again leaving the parapet much as before.

Shells with delay action fuzes are more apt to become buried than those fired with direct action ignition.

Snow.

It may appear superfluous to refer to snow as a protection were it not that history points to so many examples of actions fought on snow. Leaving out mountain ranges (which are frequently disputed) it would appear as if campaigns begun in the spring or summer, are often prolonged beyond expectation till winter sets in, and thus without going back to Hohenlinden, we find the campaigns of the Crimea, of Paris, of the Loire, and of the Russo-Turkish war, all prolonged into the winter, and snow therefore a factor.

A snow parapet is therefore by no means an impossible or unlikely factor in defence, and though I believe the test has not been tried, it is quite conceivable that a shell which was gradually deprived of its momentum would not explode but be smothered, thus giving a greater advantage to this form of protection.

Marshy or loose sandy ground in front of a position will probably be, relatively, a greater protection than formerly, as the smothering of shells having a wider radius of destruction will be increasingly important.

I have purposely avoided so far, any consideration of musketry, partly because protection from shell fire includes protection from musketry; but more because it would seem impossible to maintain troops in purely musket proof cover during the preliminary artillery action, *where their presence is known or can be ascertained*, and if Captain Maude is right in assuming that half an army corps may nowadays be rapidly annihilated by artillery fire alone, it would appear that the infantry action may be allowed to take whatever course is possible, after the artillery is subdued or exhausted wholly or partially. Into this phase of the action the same guiding conditions will not enter, and cover which is unsuitable, while under artillery fire, may again be utilised, and always may be utilised when unseen or unguessed, or to gain certain advantages in defiance of the risks.

These risks we had best understand to value duly.

Artillery can never replace infantry, and I should have added to the postulates of this lecture by saying it is only held to prepare for the action of infantry when possible.

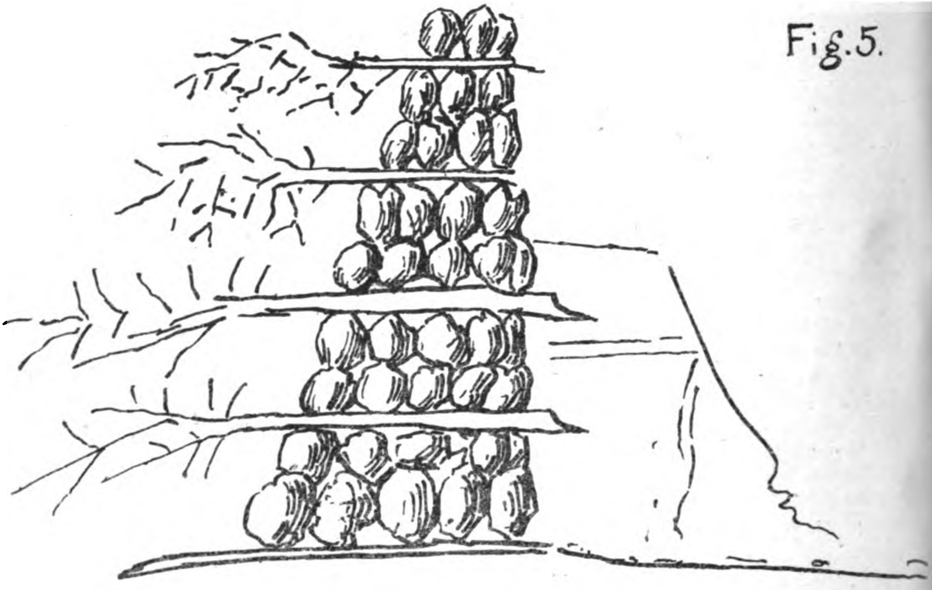
This prescribes a probation of impossibility for the infantry, during which, however, it must move to such positions as it can act from, exposed to some *certain* artillery fire, and a further *uncertain* amount which it hopes to dodge or avoid incurring. Actual infantry bullet fire, while it has enormously gained in range and intensity, and to a certain extent in penetration, cannot be said to have revolutionised the profiles of cover necessary for entrenchments, villages, &c.

Our own army has had no recent experience of meeting artillery fire in the field, and it will require not only great forethought, but will form our first consideration how to deal with the artillery phase of the action utilising cover as tactics may dictate, and never forcing the tactical consideration into subordination to academic perfection of defensive details.

From the foregoing it would seem advisable 1st, to eliminate from our books and courses of instruction all models and details which have become, not only obsolete but positively dangerous; 2nd, to carefully discriminate between war against a savage enemy consisting of infantry alone, or infantry and cavalry; and 3rd, it would appear that these details of cover should be dealt with more in a tactical spirit and with reference to the two kinds of warfare in separate volumes, as otherwise one paragraph must be corrected by the next to qualify the use for which any particular model is suitable.

As, with your permission, I propose to deal shortly with the pro-

Fig. 5.



Miranzai Wall

tection to and from artillery by "screen" and "illusion" I will only lightly consider "cover" as required in savage warfare.

Here our experience has been recent and thorough.

The siege of Chitral reads much like a chapter of mediæval romance, we hear of the water tower and the close approaches, and doubtless the garrison would have welcomed moat, barbican, and portcullis, had they been thoughtfully provided by their predecessors. The employment of advanced fires to light up the enemy and obscure the defenders was both curious and instructive, and was a makeshift use of the same principle which we may expect to see further developed in the use of the electric light.

In various climes we have learnt to know the laager and the zareeba, the sangar, and the boorj, and to adapt them to our own use.

One great principle runs through all these defences however.

Under artillery fire they would all be shell traps either from the material of their construction or the closed formation of the troops occupying them, but when rushes of overwhelming masses armed with the sword or assegai have to be met, protection takes the form of a high wall, thorny fence, or delaying obstacle or entanglement, and the spade and earth-work are comparatively useless and indeed should be almost forgotten, earth-works *per se*, being most easily rushed, as were nearly all our posts between Chaman and Candahar after the reverse of Maiwand.

This last appears an example of officers taking models from the books to oppose rushes, where the model is only designed to minimise infantry fire; and is an instance in point as to a more tactical arrangement of class books on fortification being needed.

All countries do not offer the same possibilities for erecting zareebas (where thorns are required) or stone walls, which last are not easily erected rapidly of sufficient height to keep out a rush.

Where boulders and thorns are *both* available, there is a possibility of making a wall very rapidly which is commonly used in the Miranzai valley, but perhaps not so generally known as it deserves to be.

Fig 5.

A boulder wall is made 3 feet thick and 2 feet high. Branches of thorn are then laid over it, the butts inwards and the thorns towards the enemy, binding the boulders together. Two more feet of boulders are added, then another layer of thorn and so on, tapering the wall slightly. The whole is raised to 9 or 13 feet and forms an excellent protection from a rush. This wall however would be an example of the worst cover one could possibly provide against artillery, when such a neighbourhood would be most undesirable.

It sometimes falls to the lot of officers in savage warfare to consider the question of cover for picquets on difficult and broken ground. This is a very vexed question, and it is most questionable whether entrenchment is usually desirable for picquets at all under such circumstances.

They become less watchful, are sometimes inclined to line the entrenchment and fire without cause, they hold their ground perhaps after their flanks are turned and become isolated, and, by absolutely fixing the position of the picquet, very tangled ground may be less perfectly watched.

Where required to fight a delaying action, rather than to watch, cover would be desirable, and in this respect again, savage and civilised warfare would appear, as a general rule, to point to opposite measures.

Obviously "trace" is less affected by modern improvements and remains roughly the same, while "sections" or "profiles" are greatly modified.

The next consideration I have endeavoured to lay before you for discussion is that of—

Screen.

When it became obvious that, both in Permanent and Field Fortification, no structure could be erected which could not ultimately be pulverised by artillery, there were not wanting officers who prophesied that the future fortifications would be of paper or canvas, *merely to screen from view*, avoiding structures which were only blown about one's ears. This view is, of course, fallacious, as fortifications are meant to protect for a time, delaying the enemy, and absorbing time and means even if eventually reduced, but there is more than a grain of truth in in the suggestion that it is most important to screen from sight and observation.

In Coast Defences much work is now expended in defeating observation, sometimes by planting trees and creepers, by colouring, by studiously confusing crest lines, and obliterating traces of recent earthwork.

Dover Castle is a good example of successful concealment as any one may test by trying to pick out the position of the guns on that height when crossing from Calais. The western heights on the contrary are rather plainly detected, and the gun emplacements can at any rate be guessed.

In the field use of artillery, it may be possible to adopt some variations of these methods of screening to obscure the position of batteries, and with smokeless powder observation will become more difficult.

Hurdles for instance would form a screen not subject to the disadvantages of a brick or stone wall under fire, and it is possible that canvas screens of a suitable tint might be used both for the guns and the ranging parties, especially where natural cover does not exist and where, as in the desert, mirage assists to defeat observation.

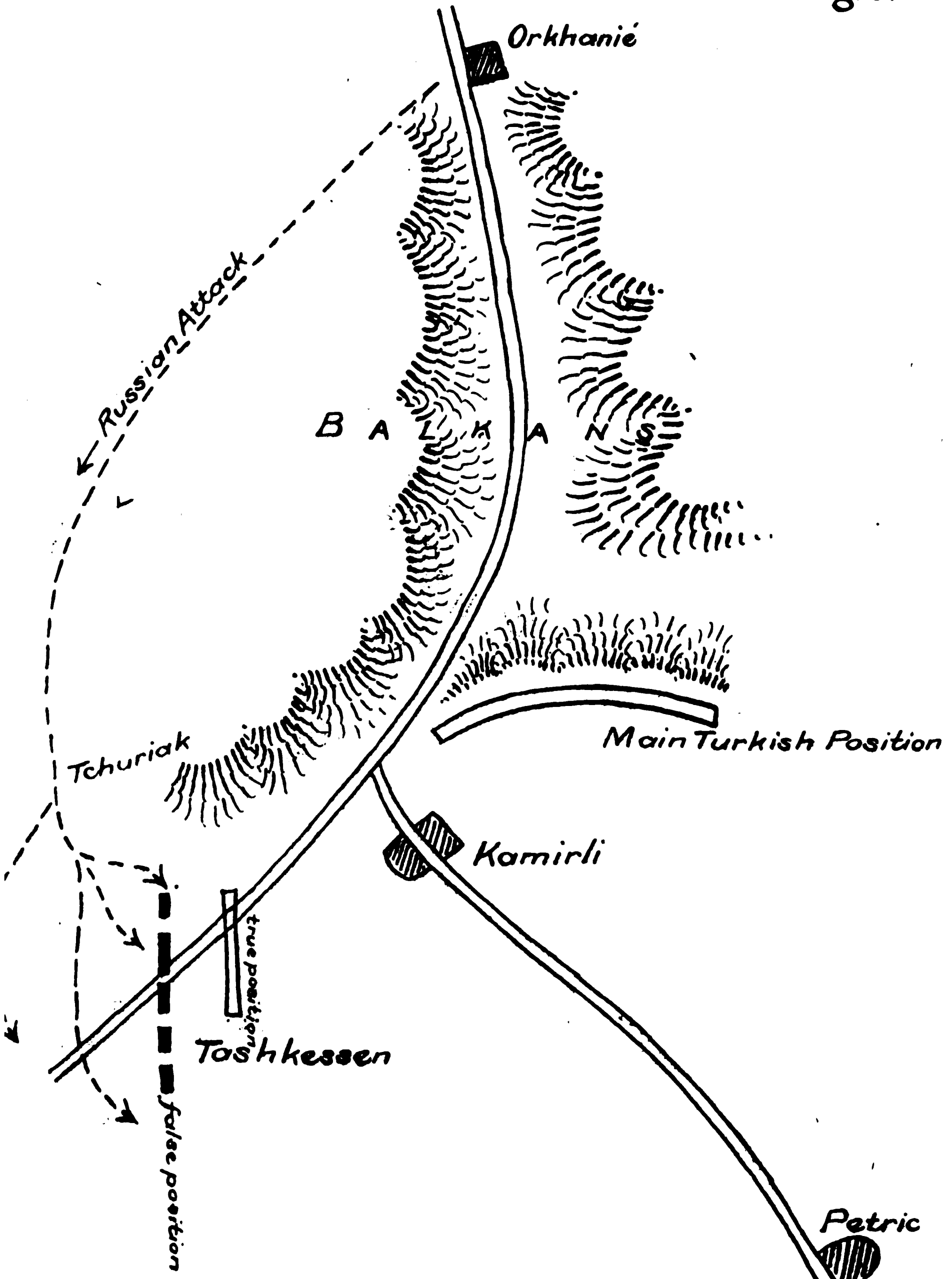
Sir George Clarke says "against artillery fire invisibility is the best form of protection, and even when the field howitzer makes its appearance, well concealed defences will have little to fear."

Balloons of course may aid in discovering concealed defences, but, generally speaking, at the present ranges, observation is most difficult and the presence or approach of artillery is more guessed at by indications than actually foreseen.

Long columns on a road, high thick clouds of dust, small ranging parties, are seized on as betraying the action of guns to follow, but all of these can sometimes be screened, and all of them can be imitated in wrong positions so as to aid in confusing the enemy.

All sportsmen who have used a glass in detecting game on a hill side at some distance, know what a difficult and protracted task it is and what special aptitude it involves It is so easy to mistake one indication for

Fig. 6.


Orkhanié
B A L K A N S
Russian Attack
Tchuriak
Main Turkish Position
Kamirli
true position
Tashkessen
false position
Petric

another, a branch for an antler, a bear for the shadow of a rock, or what not, and the resemblance of an alligator to a log of wood is well known.

Hence, surely, where we have a ready means of deceiving an enemy by screening and illusion, and no effectual mechanical means of resisting his artillery fire when once brought to bear, we should utilise all measures for obscuring our own forces, simulating strength elsewhere and frustrating the enemy's purposes by every feint and concealment available.

Screens are formed frequently enough of cavalry, light troops, or of all arms; and a good instance of this last form of screen is found in the action of Tashkessen, which is further interesting as the last occasion on which a British officer commanded in an action against European artillery—the most recent, and yet nearly twenty years ago—and in addition, it illustrates the possibility of material force being arrested by skill, character, and determination.

The causes that led to this action may be rapidly summarised

See Fig 6.

Shakir Pasha with a Turkish army corps was holding the pass through the Etropol Balkans served by the road from Orkhanie to Kamirli at which latter position his force was entrenched. After the fall of Plevna, Gourko succeeded in turning this pass by utilising the mountain paths by Tchuriak, and debouching on the plain succeeded in threatening the retreat of Shakir on Petric.

To delay Gourko, General Baker with a small force of 3,000 men and 5 guns took up a position at Tashkessen and forced an action, although his position could have been turned.

As it was only necessary to hold out till the evening of the 29th December 1877, Baker occupied two positions, a false one in advance, and a real one a mile in rear separated by a valley.

To his great joy Gourko deployed nearly 40,000 men and 3 batteries to attack the *false* position sending a division to each flank to thoroughly envelop it, and the hope then occurred to Baker that if these large forces arrived massed and disordered in the advanced position (really a screen) he might from the real one be able to repulse them, though the odds stood at 12½ to 1. Baker's original plan was the defence of successive positions but the one suggested by Gourko's premature attack was evidently better.

The attack began at daybreak, and by ½ past 12 Baker had retired to the main position which was entrenched, having 4½ hours of day light to hold out, and the attacking force being clumped and difficult to extricate for even a fresh front attack, still less to form fresh flanking columns.

Baker's position was on both flanks of the road, commanding which was a strongly built "Khan" or Traveller's Serai fit to resist field artillery and in which he placed 4 companies.

See Fig 7.

Close by in a yard he hid 2 mountain guns, which being masked, acted subsequently with the force of a surprise.

See Fig 8.

On his left his battalions were able to entrench and used the Turkish trench Fig 8. This form had been found capable of withstanding both infantry and artillery fire and cannot easily be improved upon. A small shelf or berme however might be added near the crest, to rest the elbow on, give better cover to the man, and hold his loose cartridges. It is necessary to avoid allowing this trench to be made too deep as the men then sky all their cartridges.

On Baker's right the ground was too stony to trench, but he permitted the erection of stone walls which he knew would be harmful under artillery fire, sooner than lose all protection against bullets.

In the case this was a wise decision, but each case must stand by itself, and here a great portion of the Russian artillery was diverted to Kamirli.

The defence held out till night fall, and after losing about half of its total force, had sufficient vitality to repulse a final charge of the Russian Guard with the bayonet after an action of 10 hours, which combined active manœuvring with a very trying passive defence.

Baker here employed cover, screen and illusion, and gave a further instance of the last before his retirement during the night.

The opposing sentries were only at 20 yards distance, and the Turks substituted dummy ones with perfect success and effected their junction with Shakir at Petric unmolested.

It turned out afterwards that Gourko had further been deluded by telegrams found in the office he seized, into supposing that he had the main Turkish force in front of him, otherwise he could have easily retained Baker and spared a force to seize the Acha Kamirli defile and cut off Shakir.

Since the Russo-Turkish campaign, artillery has made enormous advances and if at that time it was several times possible to compel the surrender of large bodies of men entrenched *by shrapnel fire alone*, the possibilities of its future action are hard to over estimate.

I have endeavoured, baldly enough, to examine the conditions of some minor problems of defence in detail and without generalisation and will now ask General Lewes to invite any discussion or suggestion before we are favoured with his concluding remarks.

Discussion.

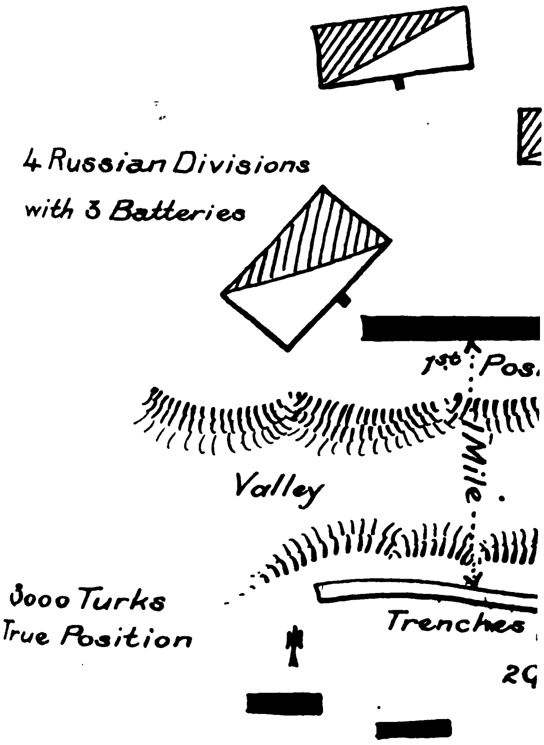
Colonel Dacres Cunningham R.A. disagreed with the remarks made by the Lecturer about *sangars* being no cover against artillery, and said that experience in the Chitral expedition showed that *sangars* afforded great protection against both artillery and infantry fire. In fact the best results were obtained, not by using common shell and trying to destroy the *sangar*, which would take considerable time, but by bursting shrapnel well in front, and driving its occupants out of it.

The Lecturer, in reply, said that he did not express any opinion of his own about *sangars*, but had simply quoted the opinion of Valentine Baker that *sangars* afforded no protection in one of the actions in the last Russo-Turkish war.

Major Ferrier R,E. remarked that he understood the Lecturer to say that *sangars* would not be efficacious against artillery fire when the projectiles used were charged with high explosives.

The Lecturer then read out certain extracts from Brackenbury's book on "Field Works" in regard to the effect of modern artillery fire

Tashkessen


4 Russian Divisions
with 3 Batteries
1st Pos
Mile
Valley
3000 Turks
True Position
Trenches
2

on walls, buildings, and villages, occupied by the French in the Franco-German war of 1870, the French being in each case driven out of strong cover by artillery fire alone; and this, the Lecturer said, would be still more the case when high explosives are used.

Major-General Lewes then rose and said—"I have very few words to say, gentlemen, with regard to the interesting lecture we have just heard; but I may mention that the shrapnel shell of our horse and field artillery of to-day will penetrate between two and three feet of ordinary masonry; it has penetrated two feet two or three inches, is believed to be capable of still greater effects, and is terribly destructive within a building after penetration. Therefore villages, unless very strongly built, can easily be attacked by our field artillery.

"I do not know what the thickness of the church wall referred to by Major Martin was supposed to be. A difficulty I apprehend with regard to high explosives at present, is to get them through a wall without premature burst, and not to delay the burst too long when they *do* get inside; their action then, however, will be frightfully destructive. The effect was described to me as terrible by those who had seen them explode in the open either immediately on striking the ground or when just rising therefrom in ricochet; the shells themselves were blown into atoms and the effect of the explosion was tremendous. With regard to their action on earthworks, it is not always so satisfactory as the action of powder shells. Earthworks may of course be composed of various soils, of clay alone, or gravel, shinglė, sand, or anything else. The effect of these high explosive shells on works such, for example, as casemates covered with earth, would be very satisfactory, provided the shell itself had penetrated down to the concrete, wood, or whatever the casemate is composed of. The tendency of all shells is to take an upward course when they get into the earth; and with regard to the delay-action fuze, of which Major Martin spoke, there is great difficulty. If that delay is too long, the effect of your shell is lost. I was only the other day reading again a lecture given two or three years ago by General Richardson—one of our very best gunners—in which he instanced the case of a shell with delay-action fuze that was fired, I think at Lydd, at a casemated work protected by a certain amount of shingle. I don't know whether it was the second or third shell, but it penetrated into the casemate, followed a passage, went out into the air, and exploded beyond the work. In that case the effect of the fuze was entirely lost. The difficulty with the delay-action fuze is to arrange it so that the delay shall not be too great.

"Although foreign powers are before us in bringing high explosives into service use, we are experimenting with them almost day by day. The Germans have smokeless powder and high explosive shells for their annual practice. We have not arrived at that yet. Whenever we do introduce high explosives, we must make up our minds to face the danger to the gun of premature explosion in its bore. We should like the effect to be infinitesimal, but at present we do not fire high explosives, except "under precautions," *i. e.*, from behind traverses, splinter proofs, or something of that sort. The Germans it is said have some guns that will to a certain extent withstand the premature explosion of high explosives; I fear we have none ourselves. I happened to be present a few years ago at some experiments at Shoeburyness where shells with high explosives burst in the bore of a 12 pr. B.L. The result was disastrous to the gun which, with its carriage, was entirely shattered. The same has occurred with larger guns, so that although perfection of manufacture has minimised the danger, it will always exist when using present guns with high explosives.

"It is possible, and of course we should like to have guns that would so far resist such explosions as to ensure their not being blown to pieces. The detachments would then not be placed in jeopardy.

"With regard to the position of artillery in connection with the sketch on the board (fig 2) illustrating the effect of artillery fire through trees, I would remark that our idea is not to take up a position where there are prominent objects on which the enemy could easily range their guns.

"If it were possible to easily see and fire through those trees from a long distance in rear we would rather use them as a screen, when it would be difficult for the enemy to properly observe their fire. As to shells bursting in the branches, we should not fire percussion but time shrapnel.

"If the wagons were at such a distance from the guns as to suffer from a consistent and uniform fire from the enemy, whilst the latter escaped, it would be easy to shift their position.

"I only mention these points as they have occurred to me. If no body wishes to offer any further remarks I will, with your consent, thank Major Martin for his interesting lecture and for his kindness in coming here this evening."

With a vote of thanks to the Lecturer and to the Chairman, the meeting then dissolved.

ON MORAL INFLUENCES IN WAR

BY

Lieut.-Colonel P. Neville, 14th Bengal Lancers.

Lecture delivered at the United Service Institution of India, on the 14th July 1896.

The conditions which tend to decide the fate of armies in the field, are ever exposed to the over-rule of the factor "unforeseen," which we are used to call "chance" or good or bad luck, as the case may be.

What seems to be the veriest accident will often times frustrate the most ably-laid schemes of the greatest General, as was the case at La Rothiere in 1813, when the interception of a despatch led to the defeat of Napoleon by the Allies. Again, a little thing—a sudden change in the weather, the rising of a river, a heavy fall of snow, a thick fog, may cause the scale of victory to turn in favour of the side against which appeared to weigh the certainty of defeat.

If, however, we eliminate this important factor, we may conveniently classify the remaining influences which bear on the result of military operations under two main heads—the physical, or material, and the moral. Physical influences will readily be understood even by those unacquainted with the art of War. These are such things as—disparity in numbers—inequality of armament—plenty or scarcity of food and clothing—good or bad ammunition supply—the nature of the ground an army must pass over with regard to the obstacles to be surmounted—the state of the weather, which materially affects the comfort and consequently the fighting spirit of the troops, and many other things of a like nature. But what my non-military hearers will find more difficult to apprehend is the fact that in warfare there are moral influences, unseen, unheard, acting in silence and obscurity on the individual minds and spirits of the soldiery, which in the aggregate are more powerful for good or evil than any of the physical factors I have mentioned. Some of these have enabled armies to contend against and overcome great difficulties and dangers, while others have caused panic and disaster in the ranks of those who apparently had every advantage in their favour.

Each material advantage or the reverse, carries with it a corresponding moral influence favourable or otherwise: on the other hand, purely abstract moral elements are none the less powerful for good or evil. Take for example the presence of some great leader in whom the soldiers have implicit confidence. In the early years of this century the presence of Napoleon on a battle field was said to be equal to an army corps of 20,000 men, so great was the confidence with which he inspired his troops, and terror caused throughout Europe by his numerous and splendid victories.

Of all the moral influences bearing on warfare, perhaps none is greater than Religious Frenzy, or Fanaticism. Those who have seen a charge of *Ghazis* will know what I mean. These men, believing that death at the hands of infidels (as they term all who differ with them in creed) opens to them the gates of the 7th Heaven—a Heaven of exquisite materialism—intoxicate themselves with some drug, and then with flashing eyes and frenzied yells of "*Allah, Allah!*" rush on to certain destruction with a fury that has about it something diabolical. There are no more difficult adversaries to deal with than those, like the *Gházis*, who court death.

During the Cábul campaign of 1879 an incident occurred which will serve to illustrate religious frenzy.

On the 12th of December a force under General Baker was employed in clearing the enemy off the Takht-i-Suleiman heights which dominate the city of Cábul. About half way up there was a plateau in front of the 92nd Highlanders. When the regiment reached this comparatively easy bit of ground after their stiff climb, they instinctively pulled up to take breath. Suddenly, with a wild yell, several hundred *Gházis* leaped over a line of stone breastwork behind which they had been hiding, and charged the Highlanders. The moment was a critical one. The men were out of breath and exhausted by climbing. The enemy rushing down the slope on them with the force of a torrent seemed as if they must sweep them over the precipice.

For a moment the Highlanders wavered. Then Captain Dick Cunyngham stood forth and called on them to remember some famous battle borne on their colours: the effect was magical: the Highlanders sprang forward as one man, meeting charge with charge, and the result was that not a single *Gházi* survived to tell the tale.

For this Dick Cunyngham received a well-earned Victoria Cross. Now here we have no less than five moral influences exemplified in this one incident.

1. *Surprise.*—There is something in the suddenness of an unexpected catastrophe which seems for a moment to paralyse the mental and physical powers, and to render men temporarily helpless. This we shall presently consider.

2. *Religious Frenzy.*

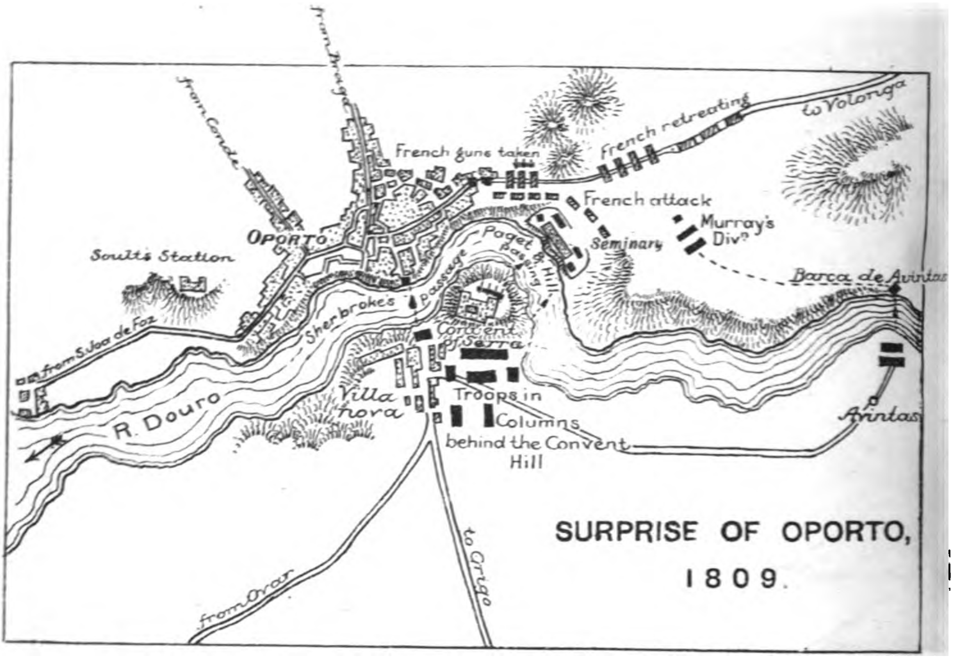
3. The influence of the example of one brave and cool-headed man on wavering troops.

4. *Esprit-de-Corps*—to which the leader appealed, and not in vain, and—

5. The vigorous forward impulse which *Counter-offence* always gives to troops who have suffered a check or reverse. This is frequently far more effective than the assumption of the initiative, because in the actual fight men's blood is hotter, and their nervous tension greater, than at the commencement of hostilities.

Like the *Gházis*, are the Egyptian *Dervishes* with whom our troops may have to engage before long. They display the same reckless bravery, have the same powerful *physique*, but are better armed than the Cábulis and have, perhaps, more skill in the use of their weapons, and it is important that we should know how to meet such attacks and with what we may overcome the demoralization naturally caused by the furious onslaughts of fanaticism.

Let us look for the weak joint in this armour—and this is easily found. A man under the influence of frenzy or intoxication is powerful only for attack. The very impulses which drive him forward tend to



SURPRISE OF OPORTO, 1809.

destroy in him the capability for defence. He will hack and thrust, but he cannot parry: he will brave every danger, but he is incapable of utilizing the great principle of union which makes all military force. What then must we oppose to these human avalanches ?

Should we like Cunyngham's Highlanders, meet charge with charge and attack with attack ? I think not. In this case he had the advantage of numbers ; in Egypt it will not be so, and for men like these in search of death, no attack will have any terrors. We should rather I think make use of just those qualities in which our adversaries will be deficient, coolness, presence of mind—cohesion—quick and steady shooting.

A calm defensive *rôle* should be our aim. Let us meet their charge as the rock meets the fury of the wave, inflexible, unflinching,—taking every advantage of our superior armament, our superior discipline, and the moral strength of union conveyed in the good old phrase "shoulder to shoulder."

The next influence I shall mention is Surprise. This has always been a powerful factor in war, and is one which we should strive to utilize to the utmost, while carefully guarding against it's employment by our foes.

As we have seen, the result of surprise on troops is a sort of moral and physical paralysis, and it will depend at critical moments on the quality of the troops themselves, and the mental balance and readiness of resource of their leaders, if this does not at times degenerate into a panic and flight.

Many wonderful feats of arms have been achieved by means of this moral influence. Let me here give you one or two examples.

In the Peninsula in 1809, by means of a surprise, Sir Arthur Wellesley drove Soult out of Oporto and eventually out of Portugal.

Soult with 20,000 men had captured Oporto. Fearing little from the English, and contenting himself with observing the movements of their fleet, he gave all his attention to the civil administration of the conquered district; and so well did he succeed in conciliating the Portuguese that they offered him the crown. Soult seems to have taken kindly to this idea of a kingdom, but all his officers did not, and the result was a plot to arrest him and carry him back to France. This conspiracy was wide-spread in the French ranks, and greatly weakened Soult's authority. His orders were either badly executed or entirely neglected, and this probably accounts for the want of military precaution and vigilance displayed by the French on this occasion, for Soult himself was a master of the Art of War.

Just a fortnight after the capture of Oporto Sir Arthur Wellesley arrived on the scene with an English force and occupied the suburb of Villa Nova opposite the town on the left bank of the Douro, while Beresford with his Portuguese Legion crossed higher up the river at Lamego so as to intercept the French retreat in the direction of Salamanca. Soult was in Oporto, on the right bank. He had destroyed all the bridges and taken over with him all the boats, and had crowned the rocky heights above the city with 200 guns. Immediately on his arrival, Wellesley proceeded to reconnoitre from the top of Mount

Serra, behind which his troops were massed. He noticed that the French had very few outposts above the town, and also that just opposite him on the other bank was a half-finished building surrounded by a walled enclosure large enough to contain 3 or 4 regiments.

This building was known as the New Seminary, and here the French had allowed to remain a number of large barges used for carrying timber and stone. Sir Arthur at once conceived the idea of a surprise, and the 'factor unforeseen' to which I have alluded, favored him on this occasion, for a poor barber, anxious to rejoin his family on the left bank, managed to elude the somewhat slack vigilance of the French patrols, and crossed in a small boat. This Wellesley seized, and in it he sent over an officer and one or two men who detached and brought back three barges. In these a battalion of infantry crossed and took up their position in the enclosure, from whence the other boats were rapidly sent over, so that in an hour and a half there were 3 regiments in the middle of the French position. In the meanwhile the whole of Wellesley's artillery was got into position on Mount Serra and General Murray with a German Brigade and the 14th Dragoons, moving up the left bank found a ford by which they crossed and moved down on the French flank.

The surprise was complete, and the English captured the town. To the credit of the French be it said that they quickly recovered themselves and fought well and bravely, retiring in good order, but none the less were they driven out of Oporto by an inferior force, and after a series of disastrous marches across the mountains, to accomplish which Soult had to destroy all his artillery, they re-crossed the frontier and took refuge in Spain.

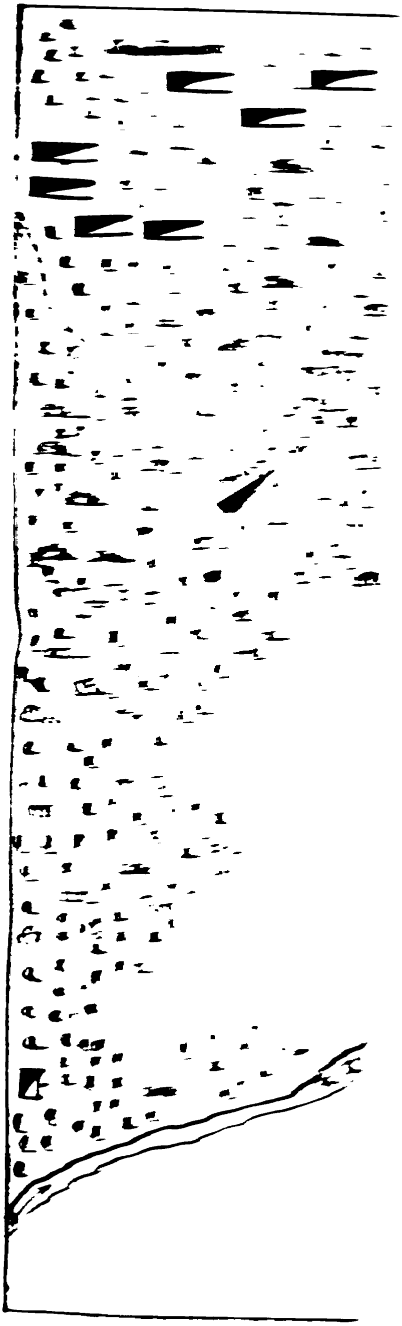
This is a curious example, and instructive as illustrating the power of surprise, for these soldiers of Soult's were old and hardened warriors who had served in many a campaign under Napoleon, and considered themselves invincible. It was owing to the admirable qualities of both officers and men that the retreat to Amorante was conducted in such good order.

Another famous surprise occurred in the Russian campaign of 1812. You will remember that in the month of June that memorable year the "*Grande Armée*" 325,000 strong with nearly 1000 guns was assembled on the banks of the Neimen.

To oppose this invasion the Russians had two armies in the field while a third under Tormasoff was hastening back from Turkey, which country through the intervention of British diplomacy, had just concluded a peace with the Czar.

Napoleon's plan was to push forward towards Moscow with all speed so as to prevent the junction of the Russian 1st and 2nd armies. In this owing to the incapacity of his brother Jerome, he was unsuccessful, and on the 3rd of August, Barclay de Tolly and Prince Bagration joined hands at Smolensko.

On the Russian right Wittgenstein was in command of a Corps 30,000 strong against whom Marshal Oudinot was advancing with the 2nd Corps, about 44,000 men. On the 30th and 31st of July there was hard fighting at Kliastitsoui, but without any decisive result. On the evening of the 31st Oudinot rather unnecessarily retired behind the river



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Oudinot
Cavalry
R. D

Drissa, which he had crossed in the morning, and bivouacked in a wood. There was but one ford over the Drissa, the banks of which are very steep and 15 or 20 feet high. At night-fall General Koulnieff, Commanding the Russian Advance Guard of 8 battalions and 14 guns, very imprudently crossed over and bivouacked on the left bank within striking distance of 40,000 French.

The wood in the form of an arc embraced the ford, the river forming the chord, and on the two extremities of the arc the trees came down to the river bank, so that the Russians could not possibly have chosen a worse position. Their crossing was reported by the French vedettes to General Legrand who was in command of the nearest troops, and he immediately formed a plan of surprise.

To this end he placed a regiment of cavalry under cover of the wood opposite the ford, and a regiment of infantry on either extremity of the arc—that is to say on either flank of the Russians—also under cover.

When all were in position, the signal for advance was given, and the cavalry moved forward very quietly at a walk. The Russians had no cavalry, and their few sentries were too close to their bivouac to be of much use in giving an alarm so that Legrand hoped to be able to effectually surprise and capture them with little or no loss. Here however, as so often happens, the General's plan was frustrated by an unforeseen occurence. A couple of Cossacks prowling about on their ponies in search of plunder, came on the French Cavalry, and immediately fled at full speed to give the alarm. The French seeing they were discovered, at once charged, but before they could reach the Russian batteries, the guns had opened on them with case, at point blank range, and 2 officers, 37 men, and 40 horses, were killed, but before the gunners could reload the Chasseurs were among them, sabring men and horses and throwing the Russian camp into the greatest disorder.

The French infantry on both flanks now charged with the bayonet which decided the contest. Koulneiff was killed: 4000 men laid down their arms, and 2000 were either killed or wounded.

I have already said that directly well disciplined troops have recovered from the first effects of a surprise, this is the psychological moment most favorable for counter-offence.

A remarkable instance of this, occurred at Polotsk about a fortnight after the affair of the ford of Sivotschina which I have just related.

On the 16th of August, Wittgenstein who had been reinforced, and now had 60,000 men, advanced against Oudinot who had also been reinforced by St Cyr with the 6th Corps, making his total up to 52,000.

After a hard day's fighting, the advantage if anything, remained with the Russians, though the French still retained possession of the town of Polotsk.

Wittgenstein had proved himself more than a match for Oudinot, who however, was wounded in the evening and handed over command to St Cyr.

This was unfortunate for the Russians, for St Cyr was one of the most capable Commanders in Europe at the time.

Expecting to be vigourously attacked in the morning, the French General spent the night in making preparations. He cleared the streets of the town, put the wounded into billets, and with empty casks and planks constructed a second bridge over the Dwina.

The morning came, but the Russians made no move. The Poles were friendly to the French and would heve helped them openly had they dared. One of them got into the Russian Camp and returned with the news that Wittgenstein was expecting large re-inforcements.

St Cyr now determined to attack before these could arrive, and planned a surprise. As his troops had suffered severely the day before, he fixed the hour of 6 P. M. for the action so that darkness might put a stop to the fight before it could become too serious. The greatest quiet was ordered along the line of out-posts and in the town. No troops were to show till the signal gun. The cavalry was massed behind a faubourg on the left of Polotsk where they had in front a vast plain. The infantry was told off—two divisions to attack the Russian Camp—one division to support the cavalry, and two divisions to guard the Town and form the Reserve. The artillery was placed under cover of the dilapidated earthworks which surrounded the town, so as to command the Enemy's camp. At 6 o'clock the signal was given and the whole of the French artillery fired a general salvo. Immediately the leading divisions sprang forward and carried the gardens of the faubourg with a rush, pursuing the Russians into the midst of their camp where they captured some guns and numerons prisoners. This surprise, through made in broad daylight was so complete that Wittgenstein was surrounded when seated at dinner in a little chateau near his camp. Jumping out of a back window, he managed to effect his escape on a cossack pony.

The Russians, panic-stricken, fled in all directions without attempting to take up their arms: the confusion was indescribable. But just at this juncture there occurred one of those inexplicable accidents of war, so common and yet so extraordinary, that they seem to be super-natural, and we can easily understand the Ancients ascribing them to the personal intervention of the Gods.

In rear of the Russian Camp was bivouacked a single Squadron of Horse Guards—a Corps d'Elite composed of young men of the best Russian families, all noble, and commanded by a Major of distinguished courage.

These, being the pick of the troops, first recovered their mental balance, and were now in the happiest disposition for counter-offence.

The gallant Major, mounting his 120 Cuirassiers, set off at full speed in the direction of the French Army. The first troops they attacked were the 26th Light Infantry who easily repulsed this attack by a single squadron. Without giving them time to rally, the Major, calling on his men to follow, set off at a gallop in the direction of Polotsk, and after him in loose order all that remained of the Squadron. The plain across which they rode was covered with foot soldiers—Portuguese, Swiss, and Bavarians, the allies of the French. Some scattered by the effects of their Victory, were trying to rally; Others were carrying off the booty captured in the Russian Camp; all were in more or less disorder. The Russian Horse Guards having knocked over a few of these stragglers,—suddenly the whole mass was seized with one of those extraordinary and unaccountable panics which now and then occur in warfare. The confusion and flight became general. St Cyr who had taken refuge in the midst of a Swiss Battalion, was bowled over, horse and all by the flying mass and had a narrow escape of his life. It is impossible to say what might not have been the result of this stampede had it not been for the prompt action of General Berckheim, who placing himself at the head of the 4th Cuirassiers, charged the Russians and killed or captured them all. Their gallant Major was killed.

In this episode we have good examples of the moral influences of surprise and counter-offence. The Russians, wearied by their hard fight the day before and seeing no movement in the French camp till evening were lulled into a false repose: they were all resting or eating. Then came the sudden attack and complete demoralization of the Russians. Now, a handful of enterprising young Nobles recover and assume the offensive. They attack French troops, in formation and fail; then, violating every rule of war, and intent only on giving their own side time to rally, they fly at the throat of a whole Army Corps, and (wonderfull to relate,) put the whole Army Corps to flight. This is a proof of what can be achieved by a handful of resolute cavalry acting suddenly and vigourously at the right moment.

Had the Russians been less demoralized; had they followed up this first success and launched their cavalry and infantry in the wake of this adventurous Squadron, the result might well have been a crushing defeat for the French at Polotsk.

Surprise will always continue to be one of the most potent moral influences in war, and the qualities required to meet it are coolness, presence of mind and at first, a vigourous defensive The moment the troops recover from their first surprise they will be in the happiest disposition for counter-offence, and the moral impulse given by counter-offence is ever a powerful aid to victory.

We now come to one of the greatest of moral forces in a military sense—that of Discipline. It is this that gives the trained soldier such an advantage over raw levies or untrained volunteers, though individually they may be equally brave and skilful in the use of arms.

To tell you what discipline has achieved in the annals of war would take more time than many lectures of the limits of this.

You that are soldiers know what dicipline is. Its' essence is implicit obedience, and intelligent subordination of will to the direction of those higher in authority; its strength lies in an unbroken chain of responsibilty; it's moral power is the quietness and confidence with which it inspires the soldier. Discipline is the very life-breath of armed masses. Without it we have but a crowd of men food for powder; with it we have a highly organized and powerful machine to whose capabilities there is practically no limit.

I can do no better here then quote for you some remarks made by Colonel (now Brigadier General) Young at the conclusion of the last lecture I had the honour of delivering in this place.

"This multiplication of power," (he says, speaking of discipline) "for it is nothing else, is only obtained, like all other things worth having by much thought and constant practice, and I do not think that at present it gets either one or the other, at all events in the way necessary. The power of discipline does not merely mean a power to keep men from running away when they would otherwise do so; it means *much* more than this, *viz*, a power to keep men from *advancing* when and where they are inclined, or from *firing* when and where they are inclined, and so on, which all requires a much higher power over them than one which merely, keeps them from running away.

It is in fact the power, when their whole natural inclination impels them to do a certain thing or go in a certain direction, to cause them to do just the reverse; to halt or turn aside when they are wild to rush onwards; or to remain silent under a withering fire without firing a shot in reply. * * * The man has got to acquire a habit, one which is strange to every feeling of all his previous existence, a habit of absolute, unquestioning, instant subordination of his will to the, perhaps apparently erroneous, will of another."

Again Major V. Hoenig, in his "*Tactics of the Future*," speaking of what he terms the psychological element, says—"The factors which formerly animated the General himself—emulation, ambition, the desire for honour and glory, enthusiasm for the cause of the war, &c., &c., must now-a-days extend to all ranks, indeed permeate the whole machine, so to speak: and this moral factor must be fostered by an iron discipline—a discipline of the Ancient Romans or Frederick the Great, otherwise the best rules and regulations are useless."

An excellent example of what discipline can accomplish is afforded by Napoleon's passage of the Landgrafenberg on the night of the 13th of October 1806.

The French army was at Jena, which is dominated by a very steep rocky height called the Landgrafenberg. The Prussian and Saxon armies were on the plain beyond. They believed that the only route by wich Napoleon could reach them was the Weimar road which passes through the Mühlthal, a long and difficult defile which they had strongly guarded.

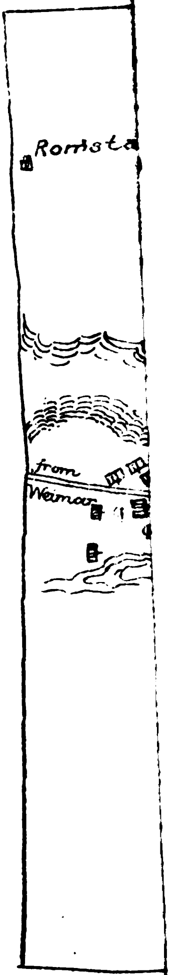
The Elector of Saxony had been compelled by the King of Prussia to join him in arms, but the Prussians were detested by the Saxon people, and so it was that, exasperated by the flames which were devouring the town, a Saxon priest offered to show the Emperor a way over the Landgrafenberg.

This he did, a narrow pathway, but from the top the great Captain noticed that half way down the other side there was a sort of rocky plateau or ledge capable of holding a considerable body of troops if closely packed, and this he determined to use as a citadel, from which in the morning to attack the Prussians.

Ordering up 4000 Pioneer tools from his Engineering Park, he set his troops to work—one Battalion at a time for an hour—to enlarge and improve the road.

Each Battalion on being relieved, was to move on in the dark in perfect silence and take up it's positions on the plateau.

The work was carried on all night by the light of torches which were un-noticed by the enemy owing to the flames of the burning town, and so


Romsta
from Weimar

it happened that by day-break there were 40,000 men massed on the Landgrafenberg. So closely were they packed that the chest of every soldier touched the back of the man in front of him, and so perfect was their discipline that the men stood, each in his place, all night without sleep or rest, and without the slightest sound, for all this was carried on within half cannon range—about 600 yards—of the Prussian camp. At day-break, under cover of a favorable fog, they were able to débouche from the ledge and form in order of battle on the plain beyond without the knowledge of the enemy. The result was a well deserved victory for the French.

Next to Discipline, I would put *Esprit-de-corps* as a moral factor of inestimable value. The greatest of all leaders, Napoleon, knew the worth of this spirit, and how to foster it in his army where it attained to the highest perfection. Teach the soldier that he belongs to the finest regiment in the world, and impress on him that his particular company or squadron should be the best and most distinguished for valour and good behaviour in the regiment, and that he himself should be the most distinguished man in his company, and such teaching cannot fail to have a good effect.

To this end it is that badges and buttons, facings and trappings, are ordained—to give men a pride in their uniform, and in my humble judgment it is a serious mistake to take away from a regiment any thing in which the men have taken a pride in the past, be this their time-honoured numbers, their buttons, their facings—what you will.

All these things help to foster the spirit of the corps, and this is a spirit that has performed many a miracle on the battlefield. In describing an attack by his regiment, the 23rd Chasseurs, on the Russian infantry at Kliastitsoui in 1812, Baron Marbot says—" This charge was executed with all the more resolution and vigour because, in addition to their habitual courage, my men where stimulated in the highest degree by the thought *that their comrades of the 24th were looking on.*" That was *esprit-de-corps*, and the result of that charge was the complete rout of the Russians.

I have mentioned confidence in their leaders as a powerful mora influence with troops. This of course to a great extent will depend on the qualities of the leaders themselves. Great Generals like Charles the XIIth, Frederick the Great, Napoleon, or Wellington have inspired their soldiers with unbounded confidence.

In the affair of the Landgrafenberg it was not only discipline, but implicit confidence in Napoleon which enabled the French troops to accomplish their wonderful achievement, and a tale is told of his marvellous influence—an incident which occurred during the battle of Essling, which is worthy of repetition.

On the first day of Essling, the Austrians had captured the village of that name and the French regiment that had formed the garrison were driven out before a very superior force and their Colonel killed.

This was reported to Napoleon, who seeing the importance of the position and having no reinforcements at hand, galloped himself up to the battalion which was re-forming outside the hamlet under a hail of bullets, and demanded—" Where is your Colonel ?" " He has just been killed," was the reply. "I did not ask," said the Emperor "if he were alive but where he was." Then a timid voice explained that his body had been left in the village. "What soldiers," cried Napoleon, "you have abandoned your Colonel to the enemy! Know that a brave regiment should always be able to show it's colours and it's Colonel, dead or alive. You have left yours in the village: go and fetch him here!" The regiment with a great cry of "*Vive l'Empereur!*" charged and re-captured Essling which they held for the rest of the day.

Such was the magic influence which the presence of, and a few words from Napoleon always exercised on his troops, nerving them to face the greatest dangers and accomplish the most difficult tasks.

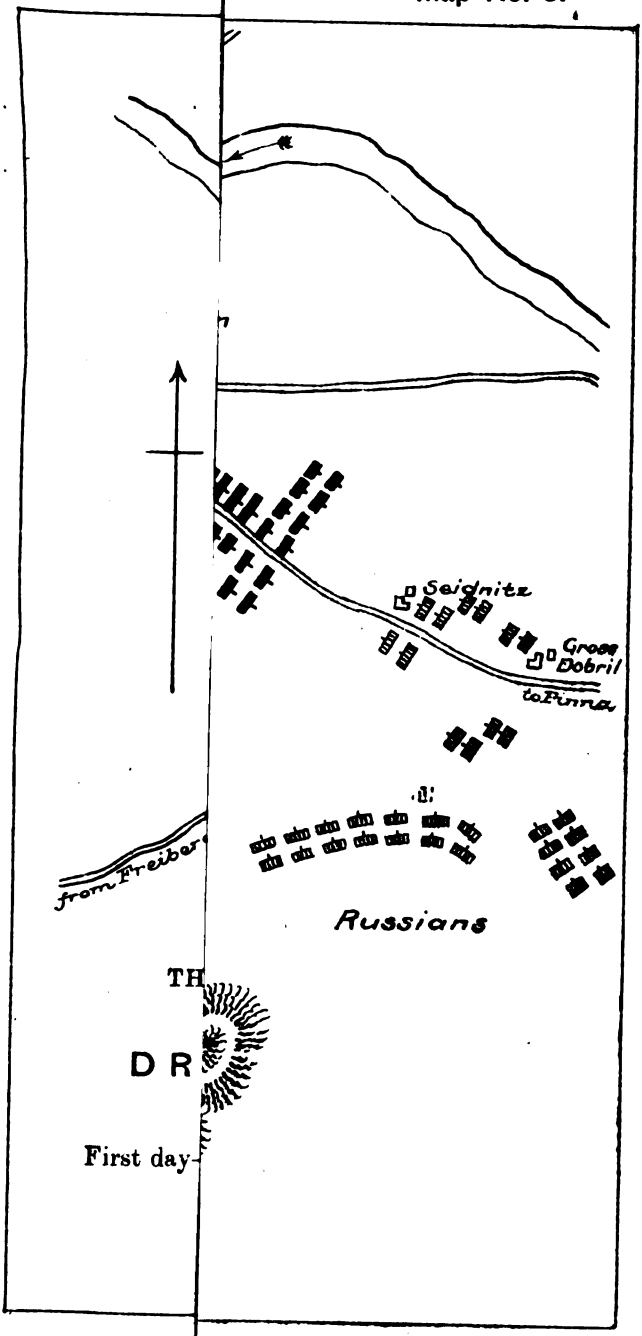
On the other hand, great leaders have inspired their enemies with fear and terror, and this moral influence has oft times turned the scale of victory.

When Junot in 1807 made his audacious raid on Lisbon with only 4000 men, so great was the terror which the victories of Napoleon had spread over the continent of Europe, that although Lisbon had a garrison of 15,000 men and that a powerful English fleet lay in the mouth of the Tagus, the Portuguese Government hastened to accede to all the demands of the Emperor, and actually offered to declare war against England in the hope of arresting Junot's invasion. And when this had no effect, on his nearer approach, the Regent, the Queen, the royal family, all the nobles and some 10,000 of the inhabitants set sail for Brazil and abandoned their country. Junot actually entered Lisbon at the head of barely 1,500 men.

But these were cowardly Portuguese—you may say.—Well, one more instance; the Battle of Dresden 1813.

In August that year Marshal St. Cyr, the same whom we saw fighting against Wittgenstein at Polotsk, was shut up in Dresden with 17,000 men. Against him was marching an allied army of Austrians, Prussians, and Russians 200,000 strong under Prince Schwartzenberg. On the 23rd Napoleon was at Lowenberg, a small town half way between Bautzen and Breslau, Here he had news of St. Cyr's danger, and leaving Macdonald in command, the Emperor himself with the whole of the Guard, a corps of cavalry and another of infantry, set out the same afternoon by forced marches for Dresden. The distance was 90 miles and yet this large force was in Dresden on the afternoon of the 26th, a wonderful march and most fortunate, for Napoleon arrived in the Capital just before the advanced troops of Prince Schwartzenberg appeared on the other side of the town. Thinking they had only St. Cyr to deal with, and seeing that the defences of Dresden were of the weakest, the Allies advanced to the assault with such impetuosity that they carried all before them, taking several out-works and occupying the faubourg of Pirna. They had reached the walls of the town and were battering at the Freyberg gate, when suddenly, by command of the Emperor—the gate was thrown wide open, and there, issuing at the 'double' appeared a column of the Infantry of the Imperial Guard. The effect was magical. The Imperial Guard meant Napoleon, and Napoleon meant the Devil! At the first sight of the bear-skin caps the assailants turned and fled in wild confusion abandoning the whole of their artillery and the redoubts they had just taken.

Map No. 5.


Seidnitz
Gross Dobril
to Pirna
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From four other gates a similar sortie was made by the Guard simultaneously and the Allies were completely routed, losing that evening some 8,000 men. The battle raged for two days but I have not time to describe it. The second day the allies lost 40,000 men of whom 20,000 were made prisoners, but this episode of the Guards at the gate illustrates the moral power—the terror of Napoleon's name.

Superiority of armament is a physical or material influence in war carrying with it a corresponding moral influence, favorable to the side possessed of it and detrimental to their adversaries. In the war of 1866 the superiority of the needle-gun affected morally and materially the result of the campaign.

But I must warn you that certain factors in warfare have been accredited with undue weight by the unthinking crowd, and this is one of them. It does not always follow that the best armed side will win, and it behoves the military student to discriminate between the true and fictious value of any such factors. Take for example, the case of sword *versus* lance.

A regiment of Hussars opposed to one of Lancers, might well feel they had little chance of success, and that of a certainty the whole of their front rank must be impaled on the formidable arm opposed to them before they could arrive within striking distance with the sword.

But there are many instances in military history to prove that the lance is not always victorious, and also that once the shock has taken place, the swordsmen have considerable advantage which increases in proportion to the length of their adversaries' lances.

Officers of light cavalry would do well to rehearse such contests to their men, as this would to great extent tend to discount the pernicious moral effect of the fear of the lance which if allowed to exercise its full force, might cause them to shirk the shock of combat.

Here is one such instance out of many.

You remember the battle of Polotsk, and how a single squadron of Horse Guards caused a panic and flight in the ranks of the victorious French, and how General St. Cyr. was overthrown by the flying masses. Well, St. Cyr was picked up by Berckheim's Cuirassiers and re-mounted. He prompthy ordered up his two reserve divisions and vigorously attacked the Russians before they had recoveied from their confusion, and defeated them.

While this was going on, the cavalry on both sides had become engaged on the Russian right.

The French had moved out into the plain with two regiments in first line, three in the second, and one in reserve. General Castex led with the 23rd and 24th Chasseurs.

The Russian first line was also composed of two regiments, of which opposed to the 23rd, were the Cossacks of the Guard. This was a *corps d'elite*, and was considered the finest regiment in the Russian army.

They were dressed in scarlet, all picked men of great stature and were armed with lances 14 feet long.

They were moreover splendidly mounted, and as they had only just arrived and had not been engaged, their horses were fresh and in good condition. On the 'charge' sounding the 23rd with unflinching valour charged knee to knee against the Cossacks. The shock was tremendous, but once it had occurred all the advantage of weapons was with the swordsmen who almost destroyed the Russian regiment and captured a number of excellent horses. In this encounter the 23rd had only 8 or 9 men killed and thirty wounded.

The assumption of the initiative has always carried with it a certain moral feeling of confidence and enthusiasm which pervades the attacking side. But it must not be accepted as an invariable rule that to attack first is always advisable.

In war there are no fixed rules, and only a few fixed axioms.

When opposed to Asiatic enemies, the prompt initiative has always proved the winning move—witness the campaigns of Clive and Wellington in India—the capture of Arcot, the battle of Assaye—but where our forces are greatly outnumbered and the enemy is European, it will frequently be prudent to sacrifice this moral advantage for a greater tactical one—that of grasping the enemy's plan of attack and thereupon devising a counter-scheme which may enable us to overthrow him. Under certain circumstances the initiative is imperative and must be promptly seized or all is lost.

An example of this occurred in 1813 when two hostile advanced guards met in the defile of Glenhausen.

Napoleon was making one of his rapid marches, his objective being Hasenau.

His Advanced Guard composed of cavalry unsupported was engaged in the long defile of Glenhausen, a rock-hewn road bordering the Kinzig river. Here there was scarcely room in the widest part for 12 horses abreast. In this narrow defile they were met by Ott's Regiment of Austrian Hussars.

The French commander promptly took the initiative and charged throwing the leading Austrian sections in confusion on those in rear. The Austrians turned and fired, pursued by the French. The pursuit lasted an hour and Ott lost 200 men, while not a single Frenchman was even wounded.

Artillery fire has always exercised a strong moral influence against troops exposed to it, while giving confidence and a forward impulse to its own side. The moral effect of artillery is estimated to be greater than its actual material value, and this is especially the case with horse artillery in a cavalry action.

The best way to overcome the natural demoralization consequent on artillery fire seems to me to be to familiarize the troops with those instances in military history where foreign armies have endured the most terrible cannonade without flinching—as the French at Essling or Wagram, and then how our own troops have stood against *their* fire, as at Talavera or Waterloo. Such tales cannot fail to stir in the hearts of our soldiery a spirit of emulation and a desire to imitate in their turn the fortitude displayed by their fathers.

A curious example of the moral effect of artillery is to be found in the history of the battle of Dresden. On the second day of the battle it poured torrents of rain, and towards evening a division of Cuirassiers under

General Bourdesoulle drew up before a strong division of Austrian infantry in square.

Bourdesoulle summoned the Austrians to surrender, as their flintlocks being soaked with rain, they were unable to fire a shot. The Austrian General demurred, observing that as the French horses were up to their hocks in mud, and could not move out of a walk, he was more than a match for them with the bayonet.

"I will destroy you with my artillery" said the Frenchman. "You haven't got any," replied ; the Austrian—"they are all stuck in the mud." "If I *show* you guns behind my leading regiment will you surrender"? demanded Bourdesoulle. "Certainly " replied the other—"if you can." The French General then advanced with no little difficulty a battery of six guns to within 30 paces of the square, and the Austrian Division laid down their arms.

An instance of the moral support afforded infantry by the enterprise of their own artillery will be found in the study of the battle of Koeniggraetz in 1866. The 57th Prussian regiment was advancing against the wood of Britz, strongly held by the Austrians. Their advance was slow and might at one time have come to a halt under the withering fire of the defenders when Captain Schmeltzer, commanding a battery in the rear, mounting his detachments on the carriages and limbers, galloped through the skirmishers and unlimbered within 400 paces of the enemy's position. His loud word of command "Action front ; at 400 paces, with case, load!" was heard as far back as the second line, and the enthusiasm of the troops was raised to the highest pitch, so that with a rush they carried the position.

The moral effect of attacks by cavalry on infantry has always been greater than their actual physical value.

Infantry armed with modern weapons, if they are cool and unflurried, have little to fear from cavalry ; but occasions will occur when they are broken and disordered, as after an assault, or when their ammunition is spent, or when they are tired and worn out by marching, fighting, and fasting, when infantry will still be a prey to enterprising cavalry, so that its moral effect is still potent, though not perhaps to the extent it was in the wars of Napoleon. In the fierce battle between the French and Russians at the passage of the Beresina during the retreat from Moscow, the 7th French Cuirassiers charged a Russian infantry column, cut it in two, and took 2,000 prisoners. Such an incident is not likely to occur to-day. At Mars-la-Tour six Prussian squadrons charged the French artillery in action, rode through the batteries and then rode over a line of infantry, but their loss was exceedingly heavy, and the more so as the survivors after the charge were overwhelmed by the French cavalry. Roughly the losses of the Prussians in this charge were 64 per cent. of the officers and 83 per cent. of the rank and file. But if cavalry attacks in front were, and are still demoralizing to infantry, much greater is their effect when delivered on the flanks or in rear ; and against their own arm, cavalry has always endeavoured to assail these points.

There is a common saying, that in cavalry actions one man in rear is equal to ten in front. The great difficulty however has always been that bodies of cavalry attempting to gain the flanks and rear of an enemy in so doing expose their own flank and rear. It is for this reason that flank attacks by large bodies of cavalry have seldom succeeded against a well led foe.

An example of the failure of a flank attack delivered under the most favourable conditions, will be found in Marbot's description of the cavalry action at the Katzbach in 1813.

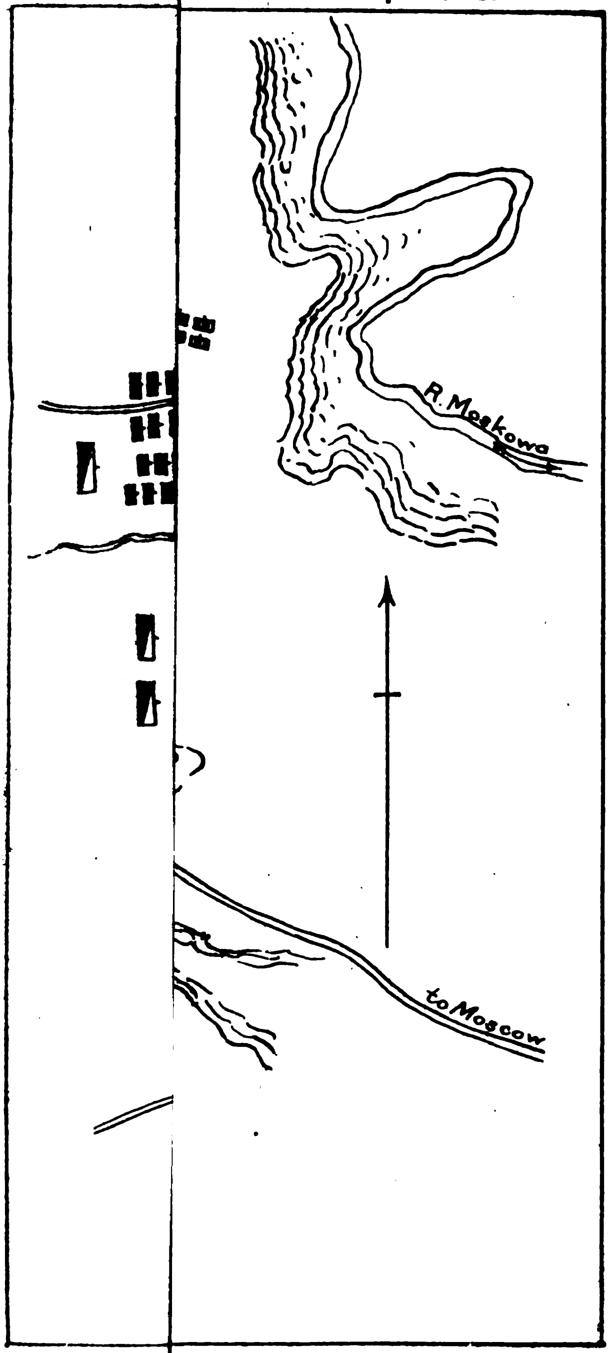
Excelmans' division had passed over the Katzbach, and was moving across the vast plateau of Jauer, in line of Brigade columns at 500 paces interval. There was no enemy in sight, but on the French right, about 1000 paces distant there was a thick wood. Excelmans had left his command and had galloped back to enquire why Marshal Sebastiani had taken away his horse artillery, about which he was very angry, and had left his troops without orders and without any scouts out. In those days scouts were only sent out by order of the Divisional General, and though Colonel Marbot had a strong suspicion that the wood was occupied, he did not dare to explore it without orders. The right Brigade column consisted of the 23rd and 24th Chasseurs and the 11th Hussars in this order. Suddenly, out of the wood on the right rear of the French, issued three regiments of Prussian Lancers in line, who with loud hurrahs charged the French column in flank. The 11th and 24th, taken by surprise, were thrown into great disorder, but Marbot with his habitual coolness ordered line to the right at a gallop—a difficult manoeuvre in those days of pivots, and this was so well and quickly executed that they were in time to meet the enemy in good order. Moreover the Prussians coming up from the right rear, exposed their left flank, and on this the 23rd caught them and rolled them up. The 11th Hussars, a Dutch regiment, ran away, but the 24th quickly rallying came to Marbot's assistance and completely routed the Prussian Lancers. Here with every element of success in their favour the flank attack failed, they exposed their own flank and were defeated. Of course this is only an episode in the battle of the Katzbach in which the French were badly beaten.

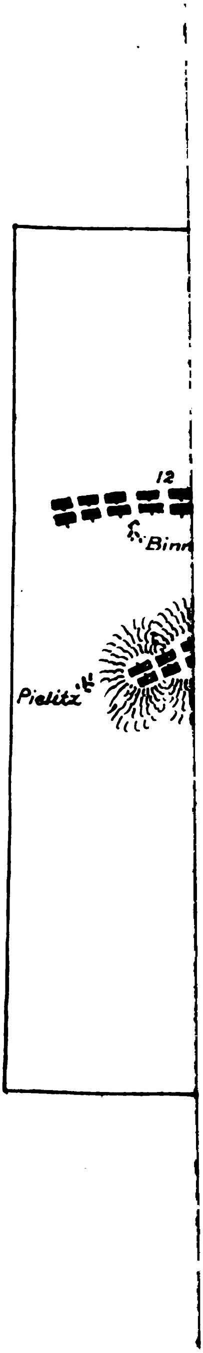
Cavalry attacks in rear are the most demoralizing of all. A curious and unique instance of this occurred during the battle of Borodino in 1812.

The Russian position was along a line of heights strengthened by Field Works—redoubts and redans, the strongest of which was a fort armed with 80 guns and known as the "Great Redoubt."

All these works were carried by the French, but the Russian Guard re-captured the Great Redoubt. General Montbrun observing that the redoubt had an open gorge and that the line of heights could be turned in flank, proposed to the Emperor to attack it in rear with his Cavalry Division, while the 4th Corps assisted by the fire of 200 guns, assaulted it in front. Napoleon approved of this daring scheme, but while giving instructions to his Brigadiers, Montbrun was killed by a round shot. The Emperor now appointed General Caulaincourt to succeed Montbrun, and he, turning the position, overthrew the Russian

Map No. 6.

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cavalry and attacked the redoubt in rear with his Cuirassiers, penetrating into the interior where he fell shot through the head. The Russians paralized by this unexpected attack in rear, fell an easy prey to the French cavalry, although they were several battalions strong with a numerous artillery force, and the Cuirassiers, by way of avenging the fall of their leader, killed the greater part of them and remained in possession of the fort, a feat of arms that decided the day in favour of the French.

The moral effect of attacks in flank or rear applies equally to infantry but in a somewhat lesser degree, as the more rapid evolutions of cavalry bring the additional moral influence of surprise to aid that of the indirect attack. What I have said too, about the difficulties attending such attacks, also applies.

On the 30th of July 1812, Wittgenstein drew his army off the route to St. Petersburg in order to fall on the left flank and rear of Oudinot's corps at Kliastitsoui, and in so doing exposed his own right flank to the French attack, and moreover laid open his line of communications. The French were victorious that day, and if Oudinot had been possessed of more dash and less of that ultra caution which marred his fame as a General, if he had only pushed boldly on that night, he might have cut off the Russian line of retreat, and St. Cyr coming up with the 6th corps, and Macdonald, who had just taken Dunabourg, closing in on their rear, they would have been surrounded and would probably have surrendered.

A glance at the map of the battle of Bautzen, which is a good example of a successful flank attack, will make plain what this exposure of the attacking army's flank means.

Napoleon at Bautzen had nearly twice as many men as the Allies, and could spare 60,000 for the flank attack under Ney, while opposing an equal number to the enemy in front. The allied Russian and Prussian army was in a strong entrenched position, and the battle lasted two days. On the evening of the first day the French turning movement was clearly seen by Barclay de Tolly from the heights above Gleina, and had he been a better General, he might easily have devised some counterscheme to oppose it. Had he, for instance, during the night retired the whole of the Guard to Wurschen, and then taken a northerly direction for 5 or 6 miles, by day-break, he would have had 24, 000 men on Ney's flank while Kleist held them in front at Baruth. Moreover, of the guard, 8000 were heavy cavalry which would have been of the greatest value, as Napoleon had no cavalry on this occassion. As it was, it proved a dearly—bought victory for the French for it cost them 25,000 men while the allies' loss was but 15,000. Moreover the allies, covered by their cavalry retired in good order by Hochkirk and Weissenberg, so that beyond forcing them to retreat the French really got the worst of the engagement.

Flank attacks therefore are not really so formidable as they seem: good generalship should usually enable us to defeat them.

Hitherto the fear of being out-flanked has, I think unduly weighed with military leaders, and has been allowed to exercise a spurious moral influence which a closer study of the annals of war would do much to discount in value.

But what is the practical lesson to be learnt from the whole subject?—for that, after all, is what concerns us most. I think it is this—that certain moral influences in war are so powerful for good or evil, that in our military training they should by no means be neglected, or lost sight of. Of these, some are only to be mastered in times of peace—on the parade ground—in the lecture room—on the range. Such are Discipline, which, as we have seen, is a slowly acquired habit formed by constant practice, and *esprit de-corps*, about which I shall have a few more words to say. The first of these in our army is not what it ought to be if we are to hold our own against all comers. We have sensibly deteriorated in our discipline since the days of Wellington. A long peace (save for minor wars) of forty years has I fear caused us to lose sight of the incalculable importance of this great moral force. What must we do then? It is not for me to say. Reforms must come from above—from the very highest authority. There is however one suggestion that I would venture to throw out, and that is, that it seems to me advisable in the interests of discipline to take away from General Officers commanding Divisions and Districts in this country the power of mitigating the sentence of a Court Martial. I am convinced that if this were done, and this power vested only in the Commander-in-Chief for General Courts Martial, and Lieutenant Generals commanding Army Corps, for all others, it would be a step in the right direction. At present there is too much mitigation, and this is to the detriment of discipline, if it does not directly encourage crime. It must be clearly borne in mind that there are two kinds of discipline. One is the slavish discipline of fear, the discipline of the circus horse, or the performing dog. This has been found necessary in the past when great numbers of ignorant and boorish conscripts had to be drilled and made into a fighting machine. It was no use appealing to their intelligence—they had none—so fear was made the master force.

Very terrible were the punishments of Federick the Great, and in 1812 even this baser sort of discipline had wonderful results in the Russian ranks; but what we require is a far higher moral standard a discipline of intelligence and knowledge. Each soldier in our ranks should be taught that he, individually, has an important part to play and that it is by his prompt and implicit obedience to orders that the whole war machine is to be brought to the highest piltch of perfection. There is no discipline without punishment, but the praise of well doing should be a far greater incentive to the good soldier, than slavish terror to the bad.

The second of these influences *esprit-de-corps*, we seem rather to discourage in our army than otherwise, and, believe me, this a great mistake. Discipline steels men for defence and teaches them to follow their leaders into danger, but it is *esprit-de-corps* that gives us volunteers for the Forlorn Hope,—deeds of heroism, good conduct, sobriety, good shooting, proficiency in military exercises.

So great a factor do I deem this moral influence on the well-being and efficiency of an army, that I would put it no whit behind discipline itself. I would bracket these two together—Discipline and *Esprit-de-Corps*.

When has the World ever seen soldiers more valiant than those veterans of Napoleon's—the heroes of Austerlitz—Jena—Friedland—and Essling? And what was the moral influence which nerved them to the accomplishment of deeds over which we are wondering still today? Patriotism?—Love of fame and glory?—Personal devotion to their Emperor?—Discipline? No; it was none of these, though doubtless each had its moral value in degree,—it was *Esprit-de-corps.* Napoleon recognized the vital importance of this spirit and knew how to foster it, *He* knew the value of badges and buttons, bits of ribbon, pompons on shakos, Eagles and Regimental Colours—in short, all the invaluable trifles which we to day in our short-sightedness have thrown away. His soldiers were, by his orders, so carefully instructed in the history and annals of their own regiments, that not a man but could tell the name of every Colonel since the Battalion was raised—of every action it had ever taken part in—of every *Sous Officer* promoted on the field. We would do well, I am persuaded, if we, as a military nation, devoted our best attention to the revival of this great moral force in the ranks of our army, and to this end in every regiment and every garrison selected officers should be detailed to lecture to the troops. By means of illustrations with the lime-light, maps &c., these lectures might be made as attractive to the men as theatricals or concerts, and would be of the greatest value in fanning the dying embers of the military spirit that once pervaded England.

Our regiments should be made familiar with their history. They should be taught to emulate the brave deeds of those who have passed away from their ranks, but whose fame and glory still shed a halo round the Colours of the Corps.

The anniversaries of great victories should be religiously kept as military holidays, and no effort should be wanting on the part of our officers to stimulate this most important moral element.

The other influences we have considered belong more essentially to the province of the battle field, but much may be learned by practice during peace manoeuvres.

Let me give you one example. We have seen the moral value of surprise, and of attacks in rear. These, taken together, are specially applicable to cavalry combats, because in infantry fights the movements of the troops must of necessity be slow, and unless under exceptional circumstances, like those of Austerlitz, it will always be difficult for them to surprise a vigilant enemy or take them in rear.

But with cavalry it is not so. They should aim at surprises at all times, and never neglect an opportunity for attacks on the rear of their adversaries. Such attacks will be most effective when delivered immediately after the shock of the opposing lines, and to carry them out special bodies of troops should be provided. Take, for example, the case of a Brigade of three regiments in the attacking line. Instead of the old fashioned and useless "succour squadrons" in rear, let us have three "surprise squadrons" following in rear of the flanks of the centre regiment and on the exposed flank.

On the 'gallop' sounding, let the Brigade advance in double echelon of regiments at half distance. When 150 yards from the enemy's line, the centre regiment charges, and a few seconds later the two refused regiments likewise charge, the independent squadrons, however, making no alteration in their pace. On the final shock, the Brigade will still remain in a double echelon, and this is the favourable moment for an attack on the enemy's rear. This will be carried out by the 'surprise squadrons,' each field troop acting independently and falling on the rear of a hostile squadron.

This is one example out of many I could give you of how we might practice the utilization of moral influences at peace manoeuvres, and thereby accustom ourselves to make them serve our ends in war.

In conclusion,— while striving to utilize to our advantage every moral element of success, we must not neglect to teach our troops rightly to estimate those adverse influences which tend to demoralization and defeat, and how to defeat and over come them.

This belongs to the province of the lecture room, a province the borders of which I should like to see greatly enlarged.

Ignorant and ill-disciplined troops are always liable to faint heartedness during a retreat, or when obliged to act on the defensive, and this demoralization is very apt to degenerate into a panic. But take the example of a skilful swordsman. He is often forced to fight on the defensive when opposed to an adversary of equal skill who attacks vigourously ; but is he dismayed ?—has he any idea of seeking safety in flight ? Never !—and why ?—because he is a master of his art. The fact of his having met his equal and perhaps superior in fence, only makes him more cool, more wary more self-possessed.

Exercising all his skill and cunning, he wards off every attack, ever watching with an eagle eye for an opening—a chance for a sudden counter-attack. And this is how the well-trained soldier ought to fight :—not with blind fury, or sullen obstinacy, but with an intelligent appreciation of the difficulties and dangers of the situation, and a firm determination to overcome them. The training necessary to this end is Discipline, and Discipline is not made perfect in ignorance but in knowledge.

With perfect discipline, the emulation given by true *esprit-de-corps* and the confidence afforded by a sense of being a perfect master of his weapons, the British soldier will fight and conquer as his fathers did in the by-gone years. We may be out-numbered but we shall not be dismayed : we may have few well-wishers and no allies amongst the great Powers of Europe and yet we shall cry—

" Come the three corners of the World in arms
And we shall shock them. Naught shall make us rue,
If England to itself do rest but true."

CASUALTIES AND THE LAWS WHICH INFLUENCE THEIR NUMBER, INCIDENCE, AND DISTRIBUTION.

BY

SURGEON CAPTAIN MELVILLE, A.M.S.

The incidence of casualties in war and the laws which govern their number and distribution form a subject which cannot fail to be of interest to every officer and man, combatant and non-combatant, whose fate it may be to have to undergo the ordeal by battle, and to none perhaps more than to those whose life on service will largely be regulated by those laws, and who may in addition be unfortunate enough to furnish in their own proper persons examples of their working. There seeems to be a popular and widespread impression, not in any way as far as I can see supported by facts, that the number of casualties must in some way depend on the potential destructive power of the weapons used by the belligerents. Were this so, we should expect to find that in proportion as that potentiality has increased, as it undoubtedly has by leaps and bounds, in the last 30 years, so should the ratio of losses to the strength of armies have increased. To judge by statistics this has by no means been the case. Let any one for instance take the losses incurred by the American troops in the North and South war and compare them with those recorded in the Franco-German war, and they will see at once that, so far from casualties having increased in any way proportionally to the increase in potential destructive power of the weapons used in the latter war as compared with those used in the former, the tendency has been rather the other way. Compare for instance the casualties in the battles of Gettysburg and Vionville Mars La Tour, 33 per cent. in the former and 9·75 per cent. in the latter, not to speak of the less bloody conflicts of Orleans and Spicheren, and the fact at once becomes apparent. Statistics, however, are as we all know, proverbially unreliable: is there then no way by which we can arrive at the fundamental principles that govern the problem? Let us reduce the question to its simplest terms.

What is a war or a battle in fact but the attempt of A to get possession of or to retain something that B has, or wishes to get. And the amount of suffering bodily and mental which either A or B is willing to undergo for the attainment of their respective objects, is the measure of the value which they attach to that attainment. It is, to use a metaphor that should appeal to us in India, the expression of the exchange value of pain and profit in the minds of each. If the profit be great then each will be ready to suffer much pain, and in proportion as pain is a trivial or a serious consideration to either, in such proportion will they be willing to suffer much or little to win the profit. Let us expand this idea. If an army be composed of men to whom by race, by education, or by reason of the hazardous nature of their daily lives, a violent death is a familiar idea, or even as in some cases an object to be, if possible, achieved, to such an army a proportion of loss, which would break the sprit of an army composed of less hardened savages, would appear comparatively trivial. Our own experience in the Soudan and Zululand gives us countless instances of this. On the other hand if the object fought for be of a high and imperious necessity, such as civil or religious liberty, the meekest and most timid of races will fight to annihilation for the attainment of that object and for the preservation of that liberty. Of this also, history furnishes numerous instances. And between the two extremes, the ferocity that throws away life cheerfully in a trivial cause, and the despair that animates resistance to the death in the most timid, there is an endless series of gradations which tend in varying degree to affect the proportion of casualties to the number of fighting men. What is the evidence of history? What are proverbially the most bloody wars? Civil and religious wars. Who are proverbially the most reckless fighters? Religious fanatics. Be they Cromwell's Ironsides or Afghan Ghazis, the men who fight for what they look on as their chance of eternal salvation, have always been the most ready to risk annihilation in the cause. And after these come men to whom defeat means racial destruction, or loss of civil or political liberty. These fight for all that makes life worth having in this world, and they fight with corresponding sternness. Casualties will then in great part be governed by the greater or less callousness to suffering of the belligerents, balanced by the greater or less importance which they attach to the object they are striving for. The callousness may arise from the constitutional recklessness of the savage, the doggedness of the Anglo-Saxon, the *élan* of the Celt, the unreasoning obedience of the Slav. The importance they attach to the object fought for will depend on the influence its attainment or loss will exercise on their future lives, or the subsequent career of their nations. The resultant effect will be in proportion to the balance of these factors. In great part, but only in part. These factors determine indeed not so much the total casualties of a war or battle, as the breaking strain of the armies engaged. Each army will fight on till its breaking strain measured as above is reached, then it will give way, and in giving way will lose not only its power of defending itself, but to a greater or less extent its power of injuring its opponent. The breaking strain therefore of one or other army being reached, the losses of the victor will to a great extent cease, those of the vanquished will continue to a point governed only by the cruelty and powers of pursuit of the victor. For a civilized army to be defeated by a savage one, means a far greater slaughter than the reverse case. So far, the question of armament has not arisen, and in fact the theory that the potential destructive power of weapons must be a ruling factor in the production of casualties can be readily disproved by *reductio ad absurdum*. The potential destructive power of any ballistic weapon varies directly with the rapidity with which it can be discharged, the range to which it can propel its missile, and the portability of that missile (I am referring here only of course to those weapons which form the personal armament of the soldier). The potential destructive power of the Martini rifle of the Turks in 1878, was obviously far greater than that of the muzzle loader of the Napoleonic wars. And yet the the greatest losses it was able to inflict were 30 per cent at the first assault on Plevna, a loss which was equalled at the Borodino. To go still further back, we pass through weapons of gradually decreasing power, the flint lock, match lock and wheel lock, till we come to the bow and arrow. It would be easy with proper data to calculate the difference in power of the Martini rifle and the bow. The former could range at least 10 times as far, could be discharged probably 5 times as fast, and the soldier could carry 10 times as many cartridges as arrows. Assuming that the greater the potential destructive power of the weapons used, the greater the number of casualties, then if the Martini rifle produced 30 per cent. at Plevna, and the French rifle never more than 10 per cent. at Vionville, the deduction is plain that the losses due to arrows in the 14th and 15th centuries must have been negligible. Which is absurd. The records of Crecy, Poictiers, and Flodden, demonstrate this. It is not the weapons but the men who use them, not what men fight with, but what they fight for, that always has, and always will influence the number of casualties they will suffer. No doubt the possession of a superior weapon with the power to use it, will always enable the less callous civilized man to annihilate the more callous but less well armed savage, simply because the latter is annihilated before the breaking strain of the former is reached, but no mechanical superiority of armament will enable the civilized soldier to defeat the ill armed savage, if the former is unable to turn that mechanical superiority to its proper use and in a sufficiently short time. Hicks Pasha's army was undoubtedly better armed than its destroyers, and probably inflicted on them, up to the moment of defeat, a greater loss than it itself suffered, but because it was unable to punish its enemy up to the breaking strain of the latter, an excessively high one, before the latter was able to annihilate the mechanical superiority of armament by coming to close quarters, it perished; its own breaking strain being a low one, and comparatively easily reached. Its losses were in fact till the moment of defeat in proportion to its breaking strain and comparatively low, and after defeat in proportion to the cruelty and powers of pursuit of its victors, and therefore unlimited. What guides then do these principles afford us by which we may estimate the losses we may expect to have to deal with in future wars? In these, speaking of wars between civilized nations, we may eliminate any inequality arising from different armaments, as as far as can be seen it is unlikely that one side will in artillery or musketry have any marked preponderance of mechanical efficiency over the other. The men too will not in physical courage vary much. Some races may be better in attack, others in defence, some may be more dashing, others more dogged, but the average civilized man, be he Celt, Saxon, or Teuton, looks with comparatively the same distaste, whatever his nationality, on the sudden death, or the lingering torture of a gunshot wound. The chief deciding factor will then be the object fought for or rather the effect of defeat or victory in the subsequent life of the individual or nation.

War to the civilized man is a thing abhorrent. A venture to be faced only in the direst necessity, a venture therefore that if faced had better be faced, once for all. *Vae Victis* ! will be more than ever the cry of the victor. If he can, he will leave the vanquished no chance of re-opening the debate ; for at least so long as he can forsee the chances of history. For instance the next Franco-German war will, it may be safely predicted, be the last Franco-German war, or at least the victor will do his best to ensure its being so. The vanquished will then know beforehand that he fights for his last chance and will fight correspondingly hard. On this count, his own losses as well as those of the victor will tend to be high. In short, men will not fight if they can help it, and if they have to fight they will fight for all they are worth. On the other hand, there is not the slightest doubt that, to return to my previous metaphor, the value of pain is appreciated as compared with that of profit of any kind. If not individual men, at least nations are far less willing to face the horrors of a long struggle, than they were a hundred years ago. The dislocation of trade, the inevitable wide-spread suffering entailed even by a successful war, appeal very strongly to those so called humanitarian and rationalistic ideas which look on the material comfort of the individual in the present, as preferable to an increase in national prestige and prosperity in the future, and it may be taken for granted, that the great mass of almost any nation, the poorer classes that is, care as a whole less for the government under which they live, than for the social system of which they form a part, and it must be remembered that while defeat a thousand years ago meant serfdom for the vanquished, and even in comparatively recent times the horrors of sack and pillage and of military occupation by a half disciplined soldiery, it now means an orderly occupation and a subsequent indemnity, the less the less the resistance. Much less would therefore the great bulk of the nation object to a defeat which destroyed an unpopular form of government, and gave room for an improved social system. Suppose for instance a defeat that destroyed a crushing autonomy and left room for a popular democracy. These conflicting factors may be expected to influence the casualties of future wars in the following manner:—

In the opening battles while there is still hope of victory the individual soldier will fight hard, and casualties be *pro tanto* high, but once the tide of victory has set definitely in one direction or the other, the voices of those who care more for material comfort than for glory, or who hope for favourable social or political changes from defeat, will make themselves heard, and the total casualties of the war be thereby decreased. For instance, take a Franco-German war, where the French were victorious in the opening battles: it can be understood that though the minor German states might be willing to suffer great losses in a victorious cause, they might on the other hand be somewhat quick, should things go wrong, to see the advantages of a surrender which should substitute for the present concentration of power in a single state, a confederacy of all the states on equal terms and with increased local liberty, and might therefore be the more ready to agree to give in before their energies were crushed by a prolonged unsuccessful resistance. They would therefore fight desperately till defeat seemed, if not inevitable, at least a fair probability, and their losses, and consequently those also of their enemies in the opening battles, would be high, but the collapse of the war would be sudden, and the total casualties and those of the later actions low. Tactical considerations however, also come in. In isolated battles the great influence that increased range will have on *tactics* is undoubted. Generals will, before the troops have become seriously engaged, be more easily able to see if their plans are hopeless or not. They will be therefore more easily able to extricate themselves from a hopeless attack, or retire from an out flanked position before heavy losses have been inflicted. At long ranges the effect of even improved weapons must be largely moral. The power of human vision has not for military purposes been increased even by optical aids, since the Crimea, and though artillery may be able to drop shells at a range of 2 miles and infantry to shower bullets at over a mile within fair proximity to their opponents, it is open to doubt whether armies will do each other much damage at those distances. Firing at an inoffensive target and firing at an enemy able to reply with equal vigour, are two very different conditions, and I think practical soldiers will agree that under the latter condition the careful aiming and the careful observation of the results of fire, so efficacious and so comparatively easy under the former condition, will frequently be conspicuous by their absence. There will thus tend to be a certain amount of comparatively harmless fencing before either commander commits himself definitely to a pitched battle. Once the battle has closed, as in previous days, perhaps even more than in previous days, the conduct of affairs will pass gradually out of the hands of the Commander-in-Chief to succesively lower grades, till at the supreme moment it will rest in the hands of the company or section commanders or even of the individual soldier himself. Battles will then be either reconnaissances in force where, owing to the long range at which it seems probable fire will be opened, losses will be comparatively small, or pitched battles, where, after the first opening phases, they will depend on the individual "grit" of the opposing rank and file, and as such will be regulated by the considerations stated in the earlier part of this paper. Applying again these considerations, we may expect that in any future war between two civilized nations we shall have a certain amount of preliminary strategic fencing, then one or more severe pitched battles, followed by, if not a sudden collapse, atleast by a resistance much less stubborn than would have been the case a hundred years ago, and gradually dying out from inanition. There is another factor which very considerably affects casualties in war, that is experience, what Prince Kraft I think calls "The habit of war, the being *aguerri*." He says (I quote from Colonel Walfords translation of the "Letters on Infantry," p. 6) "I am in a position to prove the same fact with reference to every body of troops, namely, that they suffered colossal losses in the first encounter with the enemy and later on obtained equally important results with smaller proportional losses." On page 7 he gives a striking instance of the working of this rule. This will of course always affect the losses of the later actions of any war, and to a corresponding extent concentrate the bulk of casualties into the opening battles. The point of interest to us therefore, lies in the pitched battles of the earlier period. In the earlier stages of these battles, the strain in the individual fighting man will be largely moral. Shells will burst and bullets fall close to him, an occasional lucky hit may even play considerable havoc among his comrades, but on the whole it may be anticipated that in the earlier phases more bullets will find their billets on mother earth than in human bodies. To the average man, however, the first and most obvious deduction from a "miss" is that the next shot may be a "hit." He is physically none the worse for seeing his comrade blown to bits, much less for seeing the long range fire of an opposing regiment knocking up a cloud of dust a hundred yards to his flank, but a continued experience of the latter, varied by an occasional repetition of the former, will not tend to leave his nerves in that condition of absolute equanimity necessary for careful aiming at a range beyond his normal vision, at an enemy whose position is to him a matter of faith more than sight. In the future this moral strain will have to be endured, apart from any preliminary waiting, for the length of time it takes him to cover say a mile and a half with frequent halts, and at every step it will increase in severity. Will the modern short service conscript be able under this prolonged ordeal to preserve the mechanical accuracy so essential to the proper use of his complicated weapon, sufficiently, to do any great material damage to his enemy, and will his enemy be able to do much harm to him? Is there not at least ground for supposing that the prolonged moral strain he will have to endure will so unhinge him that either he will dread to approach close to that apparently unshaken defence, or will shrink from that apparently unwavering attack before either he has done the enemy, or the enemy has done him much harm? A hundred years ago the private soldier was as often, as not, a hardened ruffian, a man of great animal courage trained to a severe discipline, accustomed even in peace to witness or even suffer what the modern soldier would look on as unearthly torture. He marched into action with bands playing and colours flying; closely locked up to his flank man, till he came to a range we would now consider as absurd. An occasional round shot passed through the ranks, he could see it and the gun that fired it: there was nothing of the "unseen" about it that there is in long range artillery fire. A few crashing volleys and a charge, and the fight was done for the time; he was hit or escaped, in any way his enemy was a living tangible entity in sight, almost in touch of him. He had no time to think till the affair was over one way or another. The carnage was no doubt awful, the records of the Peninsular are clear enough on that point at least, but it was immediate. The strain was short and sharp. Now it is long drawn out. Is the modern soldier capable of standing that long drawn strain so well as to retain the efficient use of his weapon throughout? Will he not waste his fire at impossible ranges and do little harm to his enemy, at the same time that his enemy does but little harm to him, and will either have the courage to struggle on against imminent risk of death for 2000 yards till he comes to close quarters where the struggle will be man to man? The records of recent wars hardly lead us to think so. The men who in the last Chilian war were under magazine rifle fire said that they would sooner be shot at once than go through it again; and yet the South American races, as witness their naval actions, are no mean fighting men, and have had plenty of opportunities of knowing what being shot at means. Will the average conscript after 3 years' training like it any better when it is his first experience of the sensation? I should feel inclined to doubt it. On the whole therefore, taking into consideration the moral and physical nature and breeding of the average civilized man, the moral strain that long range fire will impose on him and the excessively complicated nature of the weapon put into his hands, I feel strongly inclined to doubt if he will ever himself endure or impose on his enemy physical and material losses in any way comparable to those of earlier wars. The breaking strain of armies composed of such men will be attained mostly by moral suffering, and there will therefore be much less endurance left by which they may bear actual physical loss. I am thinking, it must be premised, of continental armies where every man not physically incapable of fighting has to fight irrespective of his moral nature. I can conceive a quite different state of things in an army composed of voluntary soldiers. They at least may be supposed to have some predilection for their trade and may therefore be able to face the early stages of long range fire, realizing that it is just as bad for their enemy as it is for them, and that to a very considerable extent the less the fear the less the danger, and that safety lies more surely in getting close enough to the enemy to silence him, than in trying to dodge his bullets at a distance. To recapitulate then, I hold that the losses of wars as a whole, will tend to be less than in the past, far less when we consider that in the last century the losses due to disease were greater than those due to battle, and that the former are gradually getting more under control. In the Franco-German war in the German Army, for the first time in history, the losses by battle were more than those by disease. But the total losses by battle will also be less, wars being shorter and there being as a rule more inducement for the vanquished to give in at an early date. Exceptions will occur where some special cause for national animosity exists. Again the losses will be concentrated in a few pitched battles which will decide the war and turn the tide of victory in one direction or the other. In these battles owing to the fearful moral strain to which the troops will be subjected they will not be able to face so great a numerical loss as they were able to face in days when the moral strain was less. And in the future as in the past, it will be not the weapons but the men who handle them, not what men fight with, but what they fight for, that will decide in the first place the losses they will be prepared to suffer and, as a corollary, the losses they will be able to inflict on their enemy.

Let us now consider the distribution of casualties in point of space. Obviously in the case of all ballistic weapons, there is an outside limit beyond which losses cannot occur, a limit decided by the extreme range of the weapons in use. From that limit up to the enemy's position, the dead and wounded will be scattered more or less irregularly. Where must we expect to meet with the greatest bulk of wounded? This is the question that to the ambulance administration is the most important of all. Now I think it may be held as certain that as a rule the chances of a man hitting with any certainty his enemy depend at any range on the certainty of his aim at that range. Unaimed fire may make lucky hits, but on the whole it is more likely to frighten than hurt. And in the case of one using a long range rifle, it is I think, at least a fair deduction that, under the moral strain imposed by service conditions, the chances of hitting beyond a range where the trajectory is practically flat, become smaller as the range increases. At that range or inside that range he has only to cover his enemy to have a fair change of hitting him. Above that range the question of careful sighting comes in, and the difficulty of making accurate shooting at such ranges is well known to all sportsmen. The practical result of this is seen in the fact that systems of attack aim at getting as many men as possible, and as quickly as possible, to a position so close to the enemy as to be able from there to bring on him a steady effective fire. The longer the attacking force takes to cross the zone of "chance" hits as I may call them, the zone corresponding to high trajectories, the greater the probability of men being wounded, on the simple principle that the longer you are out in the rain the wetter you get. Once in that position, the object apparently, is to deprive the enemy of the power of even holding his gun straight, by pouring on him a severe and effective fire. I speak under correction, and may be mistaken, but it seems to me that Prince Kraft's account of the distribution of casualties at the attack on St. Privat gives one a fairly good idea of what we may always expect in a frontal attack. He says (pp. 132 & 3 of Colonel Walford's translation of the "letters on infantry.,)" I, on the morning after the battle which continued after nightfall, found numbers of our dead and wounded lying over the whole field from St. Marie in the direction of St. Privat. These signs of the murderous struggle increased until at a range of from 500 to 600 paces ; they lay in whole ranks in a half arch round St. Privat. It must be remembered that in this attack the Germans were caught in *flagrante delicto* in close order by the French, while well within *chassepôt* range and had to advance, which they did by rushes and almost instinctively, till they got within effective needle gun range before replying. Such a mistake is not likely to be repeated, because such inequality in rifles is not likely to again occur : and yet though the Germans were exposed in close order to long range fire, they lost less at those ranges than they did at 500 to 600 yards. Inside this range the casualties were again less. To resume the quotation "Some of our comrades of the infantry judged from this fact that the French rifles shot high, and that they had fired over our soldiers when they got near. But this was not the real reason. Our infantry had suffered the heaviest loss in that line in which they had remained longest answering the enemy's fire, and had for their last rush up to the walls chosen the very moment when the fire of the defenders was altogether almost silenced." I make no apology for quoting this passage at length, for I think it holds the key of the problem. I therefore conclude that losses from infantry fire will be first felt at the extreme range of the enemy's rifle or otherwise at the extreme range at which the attack becomes visible. From that point up to a range depending on the flatness of the trajectory of the bullet, losses will depend on the time spent in covering the ground. Once a range is reached at which hitting depends no longer on sighting, but simply on holding the rifle straight, the attack must halt till it has knocked even the capacity for that simple operation out of its enemy, and it will be at that range where it has to halt for this purpose, that its main losses will occur. After that there will be one or more rushes up to the defenders position, but these will be impracticable as long as the defender has sufficient presence of mind to cover his enemy with his rifle. The near advance will therefore not occur till the enemy is so demoralized as to be practically harmless. The use of smokeless powder will make this more than ever necessary. With the heavy smoke of black powder, the attacker might rush boldly in unseen, now he can no longer do so. I have here spoken merely of infantry fire. As regards artillery the question is more open. I believe however, speaking still under correction, that as far as infantry attack is concerned, it is not expected that this shall be developed till the defender's artillery is to a considerable extent crushed. This will have to be the preliminary stage of the attack: the artillery duel. During the progress of this attacking infantry will, I understand, be kept as much under cover as possible, and the losses will be confined to the attacking artillery and the covering infantry. The whole subject of the effective power of artillery seems, however, awaiting decision. I would incline then to the conclusion that the distribution of casualties (speaking of a formal frontal attack) will be as follows. A number of casualties due to artillery fire during the artillery duel in the position occupied by the artillery at that time : a smaller number in its covering infantry, and any bodies of infantry that may happen to be in the line of fire and act as stopbutts for shots going over. A number of scattered casualities due to infantry fire beginning at the extreme range of the enemy's rifle, and increasing at first gradually, and later more rapidly, till the position of the decisive infantry fire fight is reached. Between that and the enemy's position, again comparatively few. The practical point of this is that ambulance arrangements for relief of wounded should be mainly directed on two points : (1) on the position occupied by the artillery during the artillery duel and, (2) on the position occupied by the infantry during the decisive infantry fire fight. The removal of the wounded from the former position can be carried on largely during the action and at least as soon as the cessation of the artillery duel ; that of the wounded in the latter position must I think for many considerations on which I have not space to touch here, be deferred till the close of the action.

The last point in the subject under consideration is the distribution of casualties in point of time. I think that from the nature of things, casualties must in future be spread out over a longer space of time than before. In earlier wars casualtics occurred with an appalling suddenness. Let me quote a few instances. I take my figures from a prize essay written by Captain Maude, R. E., published in Volume

XVII of this Journal. I quote his actual words:—"Scharnhorst writing before Jena, quotes instances in his own experience in which a steady volley delivered at 80 or 100 paces dropped over 60 per cent. of the enemy in their own tracks. Similar instances are to be found in our own Indian and Peninsular records." Also I may interpolate, in Wolfe's victory on the heights of Abraham. "At Waterloo the French Imperial Guard, in the quality of which it is unnecessary to dilate, was shattered by a few volleys in flank from the 52nd. In the American war the confederates at Fredericksburg reserved their fire till the attacking force, Meagher's First Brigade, was within 120 paces, and then in a few rounds drove them back with a loss of 963 out of 1200 men." Here we have a few instances (which I fancy might be multiplied considerably) of the awful carnage of battles in the past, concentrated into a few moments of time. And the reason of this concentration is evident. The soldier had a weapon that could only carry a short distance and could only be reloaded slowly, therefore he retained his fire till he was certain of its being effective. Is this likely to be the case in future, or is it not apparently rather the tendency to open fire at long ranges, and thus deter the enemy from approaching to the closer ranges where their fire would be more deadly? Tacticians only can decide: but there are some instructive remarks in Hubert's "Defence of Plevna" referring to the good effect, moral entirely apparently, of long range fire which seems to point in this direction. The point of interest for the ambulance surgeon is that the greater the period of time over which casualties are distributed, the easier will be his task, not perhaps of removal, but certainly of affording relief to the wounded.

On the whole subject I would offer the following conclusions:—

(1) Casualties as a whole will in the future be less than in the past, chiefly because men are more susceptible to suffering than their forefathers, and because the intense and prolonged moral strain to which troops will be subject will leave them less power of endurance to sustain actual numerical loss, and at the same time less power to properly utilize their highly complicated weapons and thus inflict loss on their enemy.

(2) They will be more widely scattered in point of space, owing to the increased range of modern weapons, and the consequently greater depth of fire swept ground the attacking force will have to cover.

(3) They will for the same reason be more widely spread in point of time.

And that therefore on the whole the problem before the Army Medical Department which is how to relieve as rapidly as possible all the sufferers from gunshot wounds, will not be so difficult in the future as it has been in the past.

In so far as I have had to touch on tactical matters, I have spoken of course under correction, and only ventured to do so as an amateur who has read a considerable amount of military history, a few of the standard books on *tactics*, and has witnessed a very considerable number of practical demonstrations on the subject in the shape of field firings, manoeuvres, and practice camps. Wherever my statements or conclusions are obviously erroneous, it would give me the greatest satisfaction if other contributors to the Journal would point them out to me publicly or privately.

OCCASIONAL PAPERS AND REPRINTS.

THE RENUMBERING OF NATIVE REGIMENTS IN BRITISH INDIA.

(*An Alternative.*)

BY

"FEDERATION."

The suggestion put forward by "Unity" in his essay "Tria juncta in Uno" in the December number of the Journal of the United Service Institution of India, opens up a number of important questions, the largest of which is that of political expediency.

To change the present titles of regiments of the Native Army would be pure vexation, unless in connection with a definite scheme of useful re-organisation. Now that the whole Indian Army has been brought directly under one central authority, there does not appear to be any further advantage in breaking down the barriers between the local "Commands" in order to make the garrisons interchangeable, or even to facilitate the transfer of officers from a corps recruited in one Command to a corps recruited in another Command, which latter object appears to be chiefly aimed at in "Unity's" suggestion for assimilation in the dress and titles of native regiments throughout the Indian Army.

If it were held to be necessary or advisable for political reasons either to establish "mixed" regiments all over India, or to make a point of garrisoning one quarter of India with troops drawn from another, then the assimilation of dress and titles and the renumbering of native regiments in a single series for the whole of India, as suggested by "Unity" for the cavalry of the three Presidencies, would cover and assist such a departure. But the trend is all the other way, towards territorialism and classification, and "Unity" must have been imbued with a sense of this when he suggested that infantry regiments should take their titles from the districts in which they have their recruiting centres, and when not, as in the case of Gurkha regiments, from the race to which they belong.

Class or territorial titles promise to be not less suitable for the cavalry, though it may remain unnecessary to link cavalry regiments together.

The organisation of the Native Army is still in a state of transition and it would be premature to change the nomenclature of its units before some degree of finality has been attained, or, unless with a view to to attaining finality. For instance it is by no means certain that sufficient Deccani Marathas will be forthcoming to make up the projected number of class companies in the Bombay Command. It may be found necessary to alter the caste constitution or the recruiting centres of some corps, or it may be deemed advisable to attract the best material by establishing class regiments, in which latter case "The Maratha Light

Infantry Regiment," for example, might prove a more efficacious title than "The Satara Light Infantry Regiment."

Again the desirability of a more thorough going connection between the linked battalions may assert itself. Such would be the case if the Indian Army were confronted with the probability of an exhaustive campaign. We would contemplate the event with serene composure, if, amongst other equally advanced preparations, two out of every three battalions of native infantry were ready to march at a day's notice, with not a man under two years' service in the ranks, and the third battalion so favorably situated as to be able to call up within a few days a sufficient number of trained men to bring the garrisons all over India up to their normal peace strength. This could be effected without increasing peace estimates by establishing territorial regiments on a popular basis.

The first desideratum is to have the third battalion permanently established at the recruiting centre, not only as a depot and feeder of the other two, but also as a military training school for all the martially inclined youths of the selected classes.

The benefits of British rule are so apparent, the firm, disinterested, and impartial policy of our Government so calculated to secure the loyalty, not only of the people of British India, but also of the independent Princes, that we need not henceforth apprehend internal troubles of any magnitude, and our native troops it may confidently be predicted will always remain so attached to their British officers and to the British Government, and will continue to give such an example of discipline and good behaviour, that the mistrust bred of the experiences of forty years ago will entirely disappear, and every man who has served under our colours will be looked upon as an addition to our reserve of strength in the hour of need.

The conditions of service would be somewhat as follows. All recruits would be enlisted for two years' service with the depôt battalion, receiving a free kit, but only Rs. 8 per mensem, in consideration of non liability for service outside their home district. On completion of his two years' service each man would have the choice of taking his discharge, in which case his kit would be stored at the depôt ready for re-issue; or of re-engaging for general service at Rs. 9 per mensem, in which case he would be transferred to one of the foreign service battalions as soon as there was a vacancy for him.

Two battalions out of every three would thus be always at full strength with fully trained men, and at the same time relieved of all recruiting and depôt work and of a mass of records, accounts, and correspondence, and thus free to devote all their energies to keeping themselves in perfect trim for fighting.

It would be essential for such regiments to have one permanent set of British Officers familiar with the language, the country, and the peculiarities of their men, on a distinct regimental cadre. It would also be necessary to have the senior of the 24 officers thus grouped together in charge of the depôt battalion, with two or even three of the smartest subalterns to assist him in recruiting, training, equipping, and keeping accounts and records, with staff pay in proportion to their labour and the small chance of their seeing active service as long as they were thus employed. Schemes worked out with full details, some of which could not fail to be of value, would be readily forthcoming if called for. The main object of the present sketch is to point out the facility with which permanently fixed depôt battalions of territorial regiments could on receiving orders double the strength of the Native Army by calling up at once all the reservists, and, in a short time, by the grant of a suitable bonus, all the able bodied discharged men who had ever served under its colours, not to speak of pensioners fit for garrison duty.

As regards dress, if British Officers were not liable to be transferred unless very exceptionally, even from one regiment to another, "Unity's" plea for assimilation would lose its force. A distinct uniform might even be advocated for each territorial or class regiment in furtherance of *esprit de corps*. On the other hand, a desirable cohesion would be promoted throughout the Indian Army by the adoption of a universal uniform for every soldier in the pay of the Indian Government and a great economy might be effected at the same time.

Khaki drill is generally worn throughout the Indian Army to a great extent even in cold weather. It has establshed itself as the most serviceable uniform all over the Indian Empire. As far as the comfort of the soldier is concerned he only requires a loose fitting, cool, khaki uniform for hot weather, and an easy fitting warm khaki uniform for cold weather. If our European troops were restricted to this active service uniform while in the pay of the Indian Government, our native troops would be proud to wear the same. For so large a force a first rate texture could be supplied at almost cost price.

The native soldier now receives issue after issue of serge clothing, without half wearing out what he has already on hand. With every year's service his ledger balance improves. Given one free outfit to start with, and allowances equivalent to those he at present receives, an ordinarily careful sepoy would never be in debt to the Quarter-Master.

Native regiments, having fixed depôt battalions, would be in the most favorable position to buy direct from manufacturers and make up their clothing economically in permanent regimental workshops, the measure of every man in the regiment being of course amongst the depôt records.

British officers would wear the khaki service uniform whenever on duty with troops, but would keep up the usual mess and levée dress, and the undress uniform for minor social functions as at present. They might be of one uniform pattern for native infantry and of another for native cavalry.

THE EGYPTIAN ARMY OF TO-DAY.

In view of the conflict now going on in the Soudan, it will be interesting to consider the strength of the Egyptian Army and the organisation and distribution of that force.

The *débâcle* of 1882 left Egypt without an army which it was necessary to re-create. But it is always more difficult to construct than destroy —how much more, only those know who had to face the uphill task can tell. The army of 1882 was practically limited to 6,000 men, but this has grown, as little by little the value of the new troops was discovered, till, in 1887, the present limits were reached. The great difficulty was the officers' question; for the officers of the old Egyptian Army were naturally not a satisfactory body of men, and until cadets could be trained in the military schools it was difficult to replace them. The system adopted was a modified conscription. That is to say, out of the number so available each year, a certain proportion would be chosen by lot. From these were exempted breadwinners, theological students, and many other classes. It is said that the proportion of exemption was sometimes as high as 45 per cent. The terms of service are six years in the army, five in the police, and four in the reserve. The recruit does not join as a rule till 23 years of age. This system did not at first apply to the inhabitants of the great towns, nor to the Soudanese population resident in Egypt. Little by little the work done began to show fruit. The recruit, well fed, well clothed, and regularly if not highly paid, no longer dreads the conscription as worse than death. Exempted men have frequently been known to offer themselves for enlistment, preferring military service to the daily toil of the *fellah*; and in this year of grace the utmost contentment and good feeling prevails amongst all ranks. Ginnis, Suakim, Toski, Tokar, soon showed that the new Egyptian soldier, was under good direction, capable of a degree of certain steady enduring valour. His character has been well summed up. "Initiative the Egyptian has not; decision he has not; but placed in a position in which he must quickly commit himself on a question of life or death, he, with confidence in his commander, will endure with fortitude."

Cavalry.—the Egyptian cavalry is recruited solely from the *fellaheen* or peasantry of the Delta. Very few of the recruits have ever been on a horse before joining, and do not shape well for horsemen. The seat is stiff and constrained, and the hands leave much to be desired, but it is rare to see a man thrown, or one who cannot manage his horse. The arms are—front rank, lance, all swords and carbine carried on the saddle. The horse used is the Syrian Arab, a most enduring and fearless animal, but somewhat inclined to "take hold" in his gallop. The winter dress of the men is a blue lancer tunic with black putties. In summer khaki is worn. Owing to frequent changes of commanders and other causes, the cavalry has perhaps not quite kept up with the sister arms. Still much good work has been done lately. The scouting is now intelligently performed, and the riding and gallop in line much improved. It is perhaps to be regretted that the services of officers accustomed to Native Cavalry were not requisitioned in the first instance from India. It is work which has a *cachet* of its own, to which the regular officers take some time to get accustomed. Major Burn-Murdoch, Royal Dragoons, is in command of the cavalry, and has with him Captain Legge, 20th Hussars, Captain Mahon, 8th Hussars, and Captain Adams, 2nd Dragoons. It is usual to have an English officer at each of the principal stations of the Egyptian Army, while the headquarters are at Cairo.

Artillery.—The artillery is the arm which perhaps shows to best effect the training of the English officer. The Egyptian has always shown special aptitude for the duties of a gunner. At Alexandria, with indifferent leadership and material, he stood manfully to his guns. And now the strong alert *fellah* thoroughly well trained by his English officers, shows a devotion to his work which it would be hard to equal. The technical work of the gunner, with its thousand details seems admirably adapted to fill the intellectual wants of the Egyptian mind. To load and fire his guns, to attend to their numerous wants, rounds off the ambition of the Egyptian soldier. He is a most creditable marksman; drills with great speed and steadiness; and keeps his animals and gear in most excellent condition. The enormous strength of his back and loins—the fruit of long days of labour at the snagdoop or water-lift—give him great advantages as a garrison or mountain gunner.

The horse battery of the Egyptian Army is drawn by Syrian horses of the same quality as those which carry the cavalry. The draught is pole. The guns are light Krupp, On good going and with a plentiful water-supply, this battery can do good service, as is shown by the actions of Toski and Gemaizeh; but in heavy ground, or far from water, it would soon lose its efficiency. A 14-2 Arab is not suited to gun draught.

The field batteries are provided with Krupp mountain guns carried on mules, with a second or relief line of camels.

The garrison battalion is organised on the same lines as the garrison companies in the English service, and provides for the fixed defences of Suakim and the frontier. Major Parsons, R. A., is in command of the artillery, and has with him Captains Young, Lawrie, and Peake of the same regiment.

Infantry—Of the thirteen Infantry battalions of the Egyptian army, the first eight are purely Egyptian, the remainder Soudanese. As the terms of service in the two classes are entirely distinct, it will be well to describe them separately. The Egyptian battalion is filled entirely by conscription and is composed of *fellaheen* soldiers. Its strength is about 800 men, divided into four companies. The first four battalions have three English officers per battalion, the remainder are officered by native officers. These battalions drill and handle their arms with great precision, but at manœuvres in the field are somewhat slow. The musketry is very fair, and the discipline and interior economy admirable. The clothing is blue, with the universal fez or tarbouche, of European cut and fashion. The arm is the Martini-Henry, with brown leather accoutrements. Each battalion has a small transport establishment. There is no married establishment, and the men are accommodated in permanent barracks. The rates of pay are: Private, £3-12; Corporal, £4-16; Sergeant, £-6. Soldiers re-engaging receive an increase of pay. The rations are excellent and abundant. There is an amusing story to the effect that when one of the Egyptian battalions was first raised, it was found necessary to prohibit the men on holidays from practising drill *for more than* eight hours per diem. If not true, this story is certainly *ben trovato,* as the *fellah* soldier certainly displays a remarkable aptitude for picking up drill or gymnastic exercises.

The Soudanese battalion is organised on entirely different principles. The enlistment is voluntary, the pay higher, and the terms of service practically for life. Married establishments are entertained and move with the regiment. These battalions were for the most part raised from deserters from the Khalifa's Bazingers or black riflemen, men of the Shilluk or Dinka tribe; but men have been enlisted in Lower Egypt and elsewhere. This source of supply is not considered satisfactory. The Soudanese soldier is a very interesting study; his character being a mixture of strange contrasts.

Not so quick to learn his drill as the Egyptian, in action he is full of fire and go, and requires more control. Simple as a child, he is as brave as a lion. Though quiet in quarters, he can be like a savage in action. In a word, he is like a child, requiring the firm but gentle control of some person he loves and and trusts. A Mahomedan by profession, he is fond of tobacco and the other sex, but still fonder of *Merissa* or native beer. To appreciate the man one must see him erect and alert on parade in the morning, in the evening revolving and grimacing round the watchfire of some cannibal Fanto dance. In consequence of these characteristics the Soudanese battalion, though of the same strength as the Egyptian, is organised in six instead of four companies and has a larger proportion of English officers. There can be no doubt about the fighting qualities of the Soudanese soldier, but the difficulty of recruiting them is great; there is no reserve and many of the men at present serving cannot have many years of good service in them, and a glance at the map will show that the recruiting grounds of these battalions have for some years been practically closed.

On the other hand, attempts have lately been made to call out and train the reserves of the Egyptian troops; while the extension of the conscription, with liberty to purchase exemption, to the inhabitants of the large towns, should place a considerable sum of money at the disposal of the Egyptian War Ministry.

The Egyptian ranks are: Sirdar or Commander-in-Chief; Farik or Lieutenant-General; Lewa or Major-General; Mirabai or Colonel; Kaimakam or Lieutenant-Colonel; Bimbashi or Major; Saghkolaghsi or Adjutant-Major; Yuzbashi or Captain; Malazim Awal or Lieutenant; Malazim Tani or 2nd-Lieutenant; Shawusp or Sergeant; Onbashi or Corporal; Nafar or Private.

The native officer cannot expect to rise beyond Kaimakam of a native commanded battalion—*Pioneer.*

WAR AND WEATHER

Translated from the "Russki Invalid" of 19th June 1896.

BY

MAJOR H. L. HUTCHINS, A. C. G.

The significance of weather in military operations is obvious and incontestible,—but is comparatively extraordinarily little investigated. In historical analyses of fights, whole pages are devoted to descriptions of the place—but the weather, which constitutes an equally inevitable and important circumstance, is only mentioned incidentally—and even then not always. The same may be said of books of instruction on tactics.

When military leaders possessed the opportunity of obtaining their military education by practice in the field, this very practice taught them to give due consideration to all circumstances When dictating his dispositions on the eve of a battle, the commander was accustomed to glance at the sky, like the peasant before sowing.

Military history gives us many instances, when an accidental change of weather had a decisive influence on the result of the undertaking. Whichever side knew how to make the most advantage of this accident, ordinarily won.

At the battle of Cannæ, Hannibal—by skilful movements—compelled the Romans to take up a position in which the sun was shining in their eyes, and a strong wind blowing sand into their faces. The Roman army, numerically twice as strong as the Carthaginians, suffered a crushing defeat. This apparently small inconvenience of having the sun and dust in their eyes, was probably an important one in those days, in that it deprived the Romans of clear and unimpaired vision, which is so necessary in single combats with cold steel.

Without any intention of enumerating all such events out of the number to be found in military history, we will select two or three from the best known campaigns, in order to examine them in greater detail. In the battle of Narva, at daybreak on the 19th November, (1st December New Style) 1700, the Swedish army passed through a wood by almost impracticable paths, and appeared in battle array at the distance of a cannon ball from our fortifications. It was composed of 5000 infantry, 3000 cavalry, and 37 guns. There were about 40,000 Russians with 145 guns. "The battle began" (says Mr. Leer in his work "A Sketch of Russian Wars") "by a heavy cannonade on both sides, which continued up to 2 o'clock in the afternoon. The king was waiting for the Russians to come out of their fortifications into the open field, but seeing that the enemy made no signs of moving, he ordered the attack to be delivered. The assault of the Swedish army was not expected by the Russians; besides which, no sooner had the Swedes begun to move, than the heavens, which had been perfectly clear up till then, suddenly darkened, and a violent snow storm came up right in the eyes of the Russian troops, on account of which the movement of the Swedes was not noticed." Thus, whilst the first appearance of the Swedes at the edge of the wood was plainly visible, (which is perfectly intelligible considering that the distance of a cannon shot was not then very great) yet the march of the Swedes to attack was not noticed. Evidently therefore, the snow storm had begun before they moved. On the other hand, it is improbable that Charles XII was waiting for the Russians to come out into the open field where every thing would have been against them. Surely both Charles XII and the Russian commanders understood this equally well; it was simply that the Swedish king could not make up his mind to attack the Russians behind their fortifications. But when he saw the storm coming up, he instantly understood all the advantage it would give him, and he knew how to utilise it. Thus the battle of Narva, offers are excellent historical example of profiting by the weather.

At the defence of the Isthmus of Kinburn, on the $\frac{\text{1st}}{\text{13th}}$ October

1787, the weather so altered the chances, that it required all the genius of Suwaroff to obtain the victory. The garrison of Kinburn consisted of four battalions of musketeers, besides which Suwaroff had posted on the peninsula behind the fort 22 squadrons and 4 regiments of Cossacks.. Kinburn, as is well known, is situated on a narrow neck of sand between the Black Sea and the estuary of the Dneiper. On the $\frac{\text{20th August}}{\text{1st September}}$ appeared off Kinburn a numerous Turkish fleet, consisting of 18 ships of the line, and 35 smaller craft. Suwaroff was now in a difficult position. Potemkin moved out the Russian fleet from Sevastopol to his help, sending to its commander the following order "even if all perish you must show you valour, attack and destroy the enemy". But no sooner had the Russian fleet put out to sea, than a frightful storm scattered the ships. Even the commander of the squadron barely succeeded in returning to Sevastopol, and one vessel was carried into the Straits of Constantinople. Thus Suwaroff was left without support, whilst the orders given by Potemkin, in that they fixed no date for the arrival of the fleet, allowed the commander of the squadron full liberty to wait till the storm was over. If at that time storm warnings had been sent to the shores of the Black Sea, as is done now, the fleet would have gone out a little later, and would at least have reached Kinburn.

Suwaroff himself however, knew how to take advantage of the weather, when possible.

At the storming of Ismailia on the $\frac{11}{23}$ December 1790, the signal to assault was given at half past 5 in the morning, and the columns advanced towards the fort under cover of a thick fog. The Turks first of all noticed the approach of the two right flank columns when they were at gunshot range, and a hot fire both of cannon and musketry was immediately opened from the fort.

The first to enter was the second column from the right flank and after it the first (" A Sketch of Russian Wars " by Leer).

From this description it is evident that the fog very materially helped in carrying out the assault. But this circumstance not only does not detract from the merits of Suwaroff, but on the contrary it increases them, because he skilfully took advantage of the favourable state of the weather.

Having passed a week and a half (from the $\frac{2}{14}$ December) under the walls of Ismailia, and being an early riser, Suwaroff could not but have noticed the fog, which must undoubtedly have frequently appeared on the shores of the great river at the cold season of the year. And once having noticed it, Suwaroff could not fail to attach due importance to, and to derive the full benefit from it, on the opportunity arising. On this account the assault did not commence before the appointed time, nor by signal, nor by night, as might have been expected, but at half past 5 in the morning, at a time probably, when the fog gave better cover than even the darkness of night.

Certainly, instances of conscious profiting of the appearance of the weather are comparatively rare. Moreover we have to go back for most of them to the epoch of small and more mobile armies, under the command of leaders who had grown old on the field of battle. But the importance of the weather generally speaking, grows greater with the increase in size of armies. Meteorological appearances nearly always affecting a large extent of country will naturally be all the more important for large armies.

In the same way, the improvement in fire arms, by increasing the distance to be traversed under fire, and requiring greater clearness of the atmosphere, has increased the importance of the weather.

Thus, after the battle of Königrätz on July $\frac{3}{15}$ 1866, Benedek the Commander-in Chief of the Austrian army, a remarkable tactician in the opinion of General Dragomiroff (see his work "Outlines of the Austro-Prussian War of 1866" (pages 86 and 190) saw in the rain of the $\frac{3}{15}$ July the principal cause of the frightful destruction of the Imperial Army "after brilliant fighting, which lasted 5 hours," he reported on the $\frac{4}{16}$ July, "the enemy succeeded, unobserved by us, in establishing himself in Khlum. The rain beat down the smoke, to the earth, and it was impossible to see anything, *thanks to which* our opponents succeeded in penetrating into our position at Khlum. The troops in the vicinity, unexpectedly fired upon from the flank and from the rear, wavered and broke, and notwithstanding all efforts it was impossible to stop them. As is well known, Benedek only finally decided to deliver battle on the right bank of the Elbe on the night of the $\frac{2}{14}$ to $\frac{3}{15}$ July—and the position chosen was not intimated to the troops till 4 o'clock in the morning of the day of the battle. If the evening before, he had been able to represent to himself the picture of his position wrapped up in that fatal shower of rain, he would, probably have retired behind the Elbe that very night, and thus possibly have saved his army from a terrible catastrophe.

Thus the absence of one datum, information as to the weather on the morrow, had a radical influence in the result of the whole war. It was perhaps impossible to obtain this datum in the then state of knowledge of the science of the weather, but in its present state, meteorology has made it possible to accurately present the weather at least one day of 24 hours in advance.

From this it follows that before undertaking any military operation at the present day, it is just as useful to obtain information as to the future weather as to carry out a reconnaissance of the position. So far as we change the place, just so far can we change the time of contact with the enemy, and consequently choose the weather.

It is true that sometimes the weather does not change for a long time, but frequently also the ground is very uniform on many expeditions.

As meteorological observations should invariably be made several times a day, and very systematically, and as foretelling the weather requires special knowledge, the question of the weather should always be considered by one and the same set of individuals, who would submit their conclusions as to the weather on the following day, just as others submit their sketches of the position, or road reports.

Forecasts of the weather, as is known, are made, either with the assistance of synoptical charts, or by observations carried out at some particular point.

In the first case, the central establishment collects the simultaneous observations sent by telegraph from all the meteorological stations. In the result a (weather) chart is obtained on which are represented by concentrical curves* the zones of lowest and highest pressure, cyclones or anticyclones. Knowing the conditions of movement of these zones, and the changes of weather depending on them, the latter can be foretold generally for the whole extent of the map. As a rule, observations made at 7 o'clock in the morning reach the central station in the course of the day ; by evening the chart is ready—and from it can be deduced the weather forecast for the next day.

Nevertheless, for an accurate forecast of weather in any given place synoptical charts are insufficient. Along with observations of the barometer, it is indispensably necessary to observe the variations of temperature and humidity, the direction of the wind, and the movement and form of the clouds; it is also necessary to attend to local conditions, etc. At the same time much advantage may be obtained from the study of well known practical signs prognosticating bad or good weather, etc.

Very probably, in time of war, it will often be impossible to obtain a synoptical chart in time to be of use—and the weather will have to be guessed, advantage being taken of the indications and observations above enumerated—which should be noted at least within the radius occupied by the army or detachment

In this case, observations of the height of the barometer and of the direction and velocity of the clouds generally form the best basis for judging the future weather. Variations of velocity and direction in the movements of the clouds give extraordinarily valuable indications, thanks to Colonel Pomortsef's apparatus, which permits of precise determination of these two data. Practice with this apparatus in the instructional balloon section last summer showed an interesting and well defined connection between the variations in the velocity of the high (fleecy) cloud † and the height of this barometer.

Last year, at the Krasnocelski manœuvres, from the 5th to the 12th of August, this fact rendered it possible to foretell the weather one day in advance very satisfactorily, using only the pocket aneroid and observations of the clouds. Nothing is simpler than the establishment of meteorological stations in the field, as all that is required is 3 or 4 easily portable instruments.

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* That is to say *Isobars*, or lines of equal barometrical pressure.

† That is to say, *Cirrus*.

OCCASIONAL NOTES.

ORDERS IN THE FIELD.

At the Royal United Service Institution, Lieut.-General Sir Frederick Middleton, K.C. M G., C.B., recently presided on the occasion of an interesting paper on "The Framing of Orders in the Field" being read by Lieut.-Colonel G. F. R. Henderson, York and Lancaster Regiment, Professor of Military Art and History at the Staff College.

After giving a brief but very instructive historic sketch, showing the vast importance of clear and complete orders, Colonel Henderson proceeded to deal with the art of expressing one's intentions in proper form, and, at the same time, with that rapidity which the exigencies of active service demand. To the objection that for the Staff officers of the smaller units, and more especially for regimental officers, verbal and not written orders are and will continue to be, the rule, the first answer is that regimental officers do not remain regimental officers all their lives, that they may possibly rise to high command, and that it is their bounden duty, if they intend to accept such command, to fit themselves for its functions by every means in their power. The second answer is, that while it is perfectly true that many orders, in presence of the enemy, must of necessity be verbal, yet if verbal orders are to be clear and complete some previous practice is necessary, and constantly writing them is the best practice. Again, writen orders can be more readily criticised than verbal ones. Mistakes are more patent; excuse is impossible; and the order, improved by the instructor, remains as a guide for future use. Thirdly, it is an unfortunate circumstance of war that units cannot always be kept intact, and the commander must often use an intermediary, It is a notorious fact that in war verbal messages, as a rule, are more often incorrectly than correctly delivered. Even at peace manœuvres this is the case. In the excitement of battle it is almost impossible to avoid it. While, therefore, verbal orders are often the only orders possible, practice in giving such orders is absolutely essential, and facility in writing orders will give facility in issuing them by word of mouth. Wherever, possible therefore, it is far better to reduce all orders to writing. The issue of verbal orders is most carefully practised in the German Army, and all officers, from the time they join the Service, are constantly and systematically trained in this essential phase of the art of command. What may be called the verbal war game is a method which is much used in some, if not all, of the Imperial Army Corps.

The great difficulty which confronts officers in our Service is the lack of theoretical instruction and of good models. The question really resolves itself into this: How are officers, who intend to attain such skill in framing orders as to be able to instruct others, to instruct themselves? Where are the examples with which they can compare their own efforts? Where are they to find the rules and principles which should be followed. Unfortunately, even the best of our military text-books have little to say on this important subject. In Germany, however, the contrary is the case. Not only is the framing of orders a branch of strategy and tactics absolutely recognised, but orders are the very life of all practical instruction. The manner in which principles are worked out is by imagining a certain force in a certain situation, giving the orders best adapted to the circumstances, and supplementing them with a full explanation of the reasons which dictated them. The best of the tactical treatises which follow this method is the work of Captain Griepenkerl.* This work, which deals at length with the operations of a small detached force of the three arms, contains a large number of excellent orders, and many admirable suggestions as to the considerations which must be borne in mind when writing them. Complete instruction, moreover—so far as rules and principles, without examples, can instruct—is to be found in Colonel Hare's excellent translation of the "Duties of the Great General Staff," published by the War Office, and giving what is practically a summary of Von Moltke's methods and Von Moltke's teaching. This volume, at the same time, is perhaps the most valuable tactical text-book which exists, for it embodies the experience of two great wars, and the chapter on orders is so full—at least, as regards European warfare—that it is hardly necessary to go further. The "Felddienst-Ordnung," translated by Major Gawne and Mr. Spenser Wilkinson, under the title of "The Order of Field Service of the German Army," has four short pages on orders which are nearly as valuable as the instructions for outposts.

Orders in the field come under one of three headings:—

In Wellington's Army, for instance, there were—

1. *Standing Orders.*—These were issued in the form of General Orders, were gradually embodied in printed volumes, and issued to all commanding officers.
2. *Daily Orders*, dealing with administration, discipline, subsistence, and sanitary arrangements; issued by the Adjutant-General's Department.
3. *Operation Orders*, dealing with marches, attack, the occupation of positions etc., etc., and issued by the Quartermaster-General's Department.

Of the first, the Standing Orders of the Light Division, compiled by General Crawford, are the best example. They contain much that is embodied in our present Drill Book, for it is to be remembered that in the days of the Peninsula War there were no tactical regulations with which every officer was familiar; at the same time they contain much that was only applicable to the country in which the troops were then operating. This must always be the case. Standing orders especially such as referto Supply and Transport, police and camp followers, marches, outposts, encampments, pay, and subsistence, must vary with the theatre of war.

Daily orders are not peculiar to the field, and are similar *mutatis mutandis*, to those issued in peace.

Operation orders are the important part of the subject, and whereas standing and daily orders have a very large scope, the orders for military operations are strictly limited. Dealing all of them with the enemy, and with the means by which he is to be defeated or checked, they follow much the same form, and may be embodied, to a great degree, no matter what the situation, in almost identical phraseology. In orders for marches, for attack, for defence, and for outposts, words and expressions may be said to be stereotyped. The question of the shape in which orders should be issued, however, is one on which there is no complete agreement. For the march, for outposts, and for the occupation of a defensive position, when time is not pressing, a combined order is the best method of securing intelligent obedience. When time presses, on the other hand, the speediest method of directing the troops may be to send a separate order, to each portion of the force.

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* "Taktische Unterrichtsbriefe." Berlin: Mittler & Son, Kochstrasse 68-70. 1892.

"In orders," it has been said, "tactics crystallise," and from orders, applied to a concrete situation, the extent of the knowledge of the man who gives them is most readily determined. The examinations for promotion are to-day chiefly concerned with orders, and this is a long and most practical step forward. I woud seem, however, that preparation for such examinations and instructions in the art of framing orders cannot begin too soon. Simple orders might well be made a feature of all military examinations. From the moment a boy joins as a cadet he should be taught to apply the principles of tactics by presenting his ideas in the shape of orders, and a movement in this direction has already, I believe, been made at the Royal Military College. No tactical scheme, to my mind, can be called complete, nor can full profit be derived from it, unless this is done, and unless, at the close of a field-day, the orders issued are closely criticised, full advantage has not been taken of the opportunity afforded for instruction. At the Staff College the framing of orders has long been one of the main features of the course. Every year its importance has become more clearly recognised; and at the present moment an order in one shape or another is attached to almost every report that is submitted. The system has gradually developed, and to get the best value out of written and also out of verbal orders, students should be asked to give their reasons for every paragraph of their orders. This system has been lately established at the Staff College by the present Commandant, and with the very best results.. If officers have to give the why and wherefore of every decision; if they have to explain why their detachments are of such and such a strength; why they put a battery with the advanced guard; why they send a certain number of squadrons in a certain direction; why they consider so many companies sufficient for a rear-guard, etc.; and if they are clearly given to understand that to say such a disposition is suggested by the Drill Book, or is the custom of war in like cases, is no reason at all, they will soon learn to exercise their judgment, to discard leading strings, and to apply their commonsense to the work before them. It is excellent practice to issue orders on the ground, without a map to which to refer. English soldiers have generally to fight in countries where maps do not exist, and it is of very great importance that officers should acquire the habit of describing roads, tracks, and natural features, so that there may be no mistake as to direction or objective.*

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* Compare Orders for the Attack of the Position of Vera, 5th dated October 1813—"Wellington's Despatches," Vol. VII., pp. 37-40.

With this advice to his brother instructors—and nowadays who is not an instructor in the Army? Colonel Henderson brought his lecture, which had been listened to with great attention, to a close. To those Regular officers—if such there be—who are not Cromwells or Stonewall Jacksons, who are merely ordinary soldiers, and not great men of action, who lack something of the clear insight and unerring decision of military genius, the gallant Colonel trusted he had made clear the necessity of perfecting themselves in the art of writing orders. Those who were not Regulars he reminded that Wellington, in words that should be for ever memorable, said of the Spanish troops in Peninsula that they had enthusiasm enough, but that they lacked two essential qualities—habits of obedience on the part of the men, habits of command on the part of the officers.

Without suggesting for a moment that there is any resemblance between the magnificent material of our citizen soldiers and the ignorant and half-starved levies of Spain, Colonel Henderson expressed the opinion that to some degree at least these words must be true of all troops who are not Regulars. It is impossible that it could be otherwise. Discipline is neither an hereditary nor a natural instinct. It is created by habit, and by habit only. But just as on an ordinary parade, the officer who has a good word of command, who knows his drill, who betrays neither hestitation nor uncertainty, is readily obeyed, so the officer who has learned to give clear and unambiguous orders, leaving no doubt as to his intentions, and no doubt as to what he expects, has acquired something at least of the habit of command. From practice comes confidence; and confidence apparent in every tone of a man's voice, begets confidence in others.—*United Service Gazette.*

NAPOLEON'S FIRST EXPERIENCE OF WAR.

In a recent number of THE COSMOPOLIS appeared an article by M. A. Chuquet on *Napoleon's First Experience of Actual War*, an event little known, but interesting as illustrative of the energy, ambition, and skill of the young soldier, at that time only twenty-three years of age. Captain of the 4th Regiment of Artillery, Napoleon—as Captain Bingham's sketch of his early life proves—was tricky, insubordinate, a liar, a malingerer, and he contrived, under pretext of taking home his sister Eliza from St. Cyr to her home, to reach Corsica at the beginning of October 1792. There he was elected lieutenant-colonel second-in-command of the 2nd Battalion of the paid National Guards or Volunteers. The nominal commanding officer was Lieutenant-Colonel Quenza, but Napoleon from his greater experience, decision, and nerve, was the real commander of the battalion. In vain did the Minister of War order Napoleon to rejoin his proper regiment on the Alpine frontier. As M. Chuquet says, "his dream was to be the right arm of old Paoli, then to succeed him, to become Dictator, and, to use the expression of the islanders, the "General of Corsica," even of a Corsican Republic withdrawn from the domination of France. Such was the secret object of his twentieth year." The Corsicans in the autumn of 1792 conceived various designs for the conquest of Sardinia. When the allies had withdrawn from the north east of France, various extensive plans were formed and abandoned, and eventually they resolved themselves into a scheme for conquering the Madeleine, a chain of islands between Corsica and Sardinia. Colonel Colonna-Cesari was to command, and the force was to consist of a detachment of Artillery, the Grenadier Company of the 52nd of the Line, and the battalion of volunteers in which Napoleon was second-in-command. The artillery consisted of a mortar, one 2-pounder, two 4-pounder guns, and one 24-pounder. The escort was a corvette of war. After one false start, despite the opposition of three Sardinian galleys, the expedition landed on the island of St. Etienne, with the loss of only one man wounded, on the 22nd February. On the 23rd the Corsicans gained possession of the tower of St. Etienne, notwithstanding the resistance of the garrison of twenty-five Swiss with three pieces of artillery. During the night Napoleon caused a battery to be erected and armed with a mortar, two 4-pounders, and the 24-pounder, on a mamelon from which he threw shells and red-hot shot on the village and small forts of La Madeleine. With these he set fire to the village on the adjoining island separated from St. Etienne by a narrow channel only, burnt a timber-yard, and silenced the Sardinian artillery. On the evening of the 2nd it was decided to cross into La Madeleine the following morning. The sailors on board the corvette which was to cover the passage became nervous and mutinous. In spite of the earnest remonstrances of Colonna-Cesari, they prepared for departure. At length the crew yielded so far as to consent to remain six or eight hours longer in order to enable the troops to be re-embarked. The latter, especially Napoleon, manifested the utmost indignation, but persistence was useless, the corvette was already in the offing, and the transports were preparing to follow her. There was no choice but to abandon the enterprise. At this moment the enemy applied pressure. A body of armed men from La Madeleine under an old soldier and some Swiss had landed on St. Etienne, and creeping round unperceived, took the mamelon occupied by the Corsicans in rear. Napoleon had not expected any danger from this direction, and with singular carelessness had not even posted a single sentry. Suddenly the Sardinians and Swiss made a dash at the guns. A last discharge checked the assailants somewhat, and gave Napoleon just enough time, with great difficulty, to drag his pieces to the adjoining shore and cast them into the sea. The retreat was covered by the grenadiers of the 52nd Regiment, and eventually the whole force reached the boats which took them off to the ships. Napoleon was the soul of the retreat, and without his calmness and energy the whole force would have been compelled to lay down their arms. When Napoleon met Colonna-Cesari on board the corvette, a violent scene ensued. He accused his commander of weakness and want of skill. The sailors took the part of Colonna-Cesari, Napoleon narrowly escaped being thrown overboard. Thus ended Napoleon's first fight which, although it was unsuccessful, gave him an opportunity of showing that even then the germs of a great commander were beginning to sprout.—*Broad Arrow.*

A Combined Tent and Valise for Service and Shikar.

Captain P. M. Sykes, 2nd Dragoon Guards has invented a Patent Tent and Sleeping Valise which appears to exactly meet the requirements of officersand travellers.

This invention consists of a ground sheet of mail canvas, 6ft. 0 in. × 2ft. 3in., with side flaps and a baize lining, which can be stuffed with hay, &c., so as to form a mattress.

At the top end a bag is attached, which, when filled with clothes, &c., forms a pillow.

To the bottom end is fastened an over-sheet of lighter, but equally waterproof material, which is kept off the body by means of two small iron standards, the head being additionally protected by means of light curtains, which can be let down and fastened up at will.

The advantages of this valise are that it not only serves as a receptacle for bedding, but affords complete protection from every sort of weather.

It is invaluable for all officers, whether on active service or on sporting expeditions, as the "tent" covering effectually excludes both rain and dew, and yet ensures a free supply of air.

The total weight is 12¾lbs, which makes it the lightest bedding valise yet patented, and when rolled up is adapted for pack-transport.

It has been tested under various climatic conditions for two years, and is highly approved of in military and sporting circles. It is specially recommended for travellers in hilly countries, where the transport of tents is frequently impossible.

The valise only costs £ 3-3-0 and may be procured either from the Army and Navy Stores, or from the Manufacturers, Messrs John Pound & Co., 38 Old Bond Street, London.

The Transport Arrangements of the Suakim Force.

The rapidity and ease with which the shipping required for the conveyance of the Indian troops to Suakim was provided, has been favourably commented upon, not only by the English Press, but by the service Journals of France and Germany. Owing to various circumstances, only one of the Royal Indian Marine troopships was immediately available for this service, and it is therefore all the more creditable to the Marine authorities that hired tonnage was provided so expeditiously and easily.

The Director of the Indian Marine was informed by telegram on the 10th May 1896, that transport was required for one regiment of Native Cavalry, two battalions of Native Infantry, one Native Mountain Battery, and one company Sappers and Miners. The R. I. M. troopship "*Warren Hastings*" was immediately told off for the conveyance of the 26th P. I. and the Brigade Staff, while the B- I. S. N. Company's steamer "*Henzada*," then lying in Bombay Harbour, was taken up for the transport of the Sappers and Miners, two field Hospitals, half a Veterinary Hospital, and the Machine Gun Detachment. She was sent into dock on the 11th, and by the 18th was ready for sea. On the same day another transport—the "*Bhandara*" was taken up for the conveyance of the 35th Sikhs ; but subsequent modifications in the medical arrangements necessitated the transfer of 2 companies of this regiment to the "*Henzada*", in place of the Sappers and Miners who were reserved for another vessel.

On the 11th May, several vessels were surveyed, but none found suitable for trooping. Though mostly well fitted for carrying stores, they all proved ill adapted to the conveyance of men and animals, owing to their not being ventilated, and to their iron decks being unsheated with wood. Here it may be mentioned that one of the steamers of the P. and O. Company, the "*Rohilla*", was rejected on account of the delay which the removal of her cabin fittings would have caused.

On the 12th May the Asiatic S. N. Company's S. S. "*Nurani*," and the B. I. S. N. Company's "*Chyebassa*", and "*Vadala*", were taken up as transports, but could not be fitted up for trooping duties until the 14th, as they had first to discharge a good deal of cargo. Nevertheless, so excellent were the Dockyard arrangements, that by the 20th they were all ready for the conveyance of the men, horses, and camels of the 1st Bombay Lancers, besides a large flock of sheep shipped by the Commissariat Department.

Conveyance for the Mountain Battery was still required. On the 15th the B. I. S. N. Company's S. S. "*Lawada*" was engaged, and by the 23rd had been fitted up for the reception of the men, mules, guns, and horses of the battery, besides another flock of 200 sheep belonging to the Commissariat.

At this stage the alterations of the Medical Department necessitated the provision of an extra transport for the conveyance of the Sappers and Miners, various details of the Commissariat and Ordnance Departments, and the Field Post Office. The "*Goa*," another of the B. I. S. N. Company's fleet, was taken up for this purpose on the 16th, and by the 20th she was ready for sea,

The whole of the seven transports required had thus been surveyed, hired, and fitted up between the 13th and 23rd of May, a very smart performance, when it is remembered that many of the ships had to discharge large quantities of cargo before they could even go into dock.

Each of the transports was painted according to the Marine Regulations, and allotted a number as follows :—

No. 1	Hired Transport	"Bhandara."
„ 2	„ „	"Henzada."
„ 3	„ „	"Nurani."
„ 4	„ „	"Chyebassa."
„ 5	„ „	"Vadala."
„ 6	„ „	"Goa."
„ 7	„ „	"Lawada."

Each of the above were provided with the blue ensigns of the transport service, with water tanks, horse, mule, and camel slings, coir mats for stable standings, hay nets, head pads, besides the arm racks, lance racks, &c., required for the use of the troops.

After the transports had sailed, it was found that about 1,500 tons of stores and a portion of the Native General Hospital still required conveyan to Suakim, and as the R. I.M.S. "*Canning*" had become available, she was detailed for the duty accordingly.

The R.I.M.S. "*Minto*" was despatched from Aden to Suakim on the 23rd May, to make the necessary arrangements for landing the forces, and for berthing the transports, under the direction of Captain F. Barwick, R.I.M., who had been detailed for duty as Marine Transport Officer.

The coaling of the fleet was also a matter of some difficulty. In almost every case owners provided it under this own arrangements, Government paying Rs. 15-8-0 per ton, for Bengal coal, and Rs. 21 for Welsh coal, trimmed in bunkers and ready for use. In this connection it is interesting to note that out of the 5000 tons provided, over 4500 tons came from the Bengal collieries. Four out of the seven transports carried nothing but country fuel.

The fitting out of the ships threw a great deal of work on the officers of the R. I. M. Dockyard, and the officials of the Princes Dock. It was of course a small undertaking compared the Egyptian expedition of of 1882, or the Suakim expedition of 1884, it was nevertheless a difficult task, smartly and well carried out, and gives convincing proof of the value of a local service such as the Royal Indian Marine, the officers of which are practically acquainted with the transport requirements of Indian troops, are thoroughly in touch with local shipowners, and have an efficient Dockyard, with a sufficiency of skilled labour, available for the rapid preparation of all necessary fittings &c. It would be interesting and instructive to compare the transport arrangements of this and the Egyptian expedition of 1882 with those made in 1802 for Egypt, in 1810 & 1811 for Mauritius and Java, and in 1856 and 60, for China. Then, as now, the details were worked out by the officers of the Indian Marine, for, in spite of many changes and vicissitudes, the local service remains the same, whether called by its modern title of Indian Marine, or by the older one of the Indian Navy.

REVIEWS OF RECENT BOOKS.

Memoires d'un Aide-Major sous le Premier Empire: Guerre d' Espagne 1808-14. By S. Blaze Paris. Flammarion: price 6 francs.

TRANSLATED FROM THE REVUE DU CERCLE MILITAIRE

BY

RÁJPÚT.

I.

This work, written by a young Surgeon who served with the French armies in Spain, is full of curious and interesting personal details. The introduction commences with a quotation " from Napoleon's speeches at St. Helena. " La guerre d'Espagne m' a perdu. Toutes les circonstances de mes désastres viennent se rattacher à ce nœud fatal. Elle a divisé mes forces, multiplié mes efforts, compliqué mes embarras, ouvert une école aux soldats Anglais. C'est moi qui ai formé l'armée Anglaise dans la Péninsule."

II

In France, the Peninsula War is the least studied of all the Napoleonic campaigns, which is to be regretted as the war is rich in examples of strategical and tactical combinations, and is particularly instructive with regard to partisan warfare. The author relates many instances of the merciless cruelty of the Spanish Guerillas, and of the terrible reprisals taken by the French.

The French losses in Spain between 1808 and 1814 amounted to close on 200,000 men—a far greater number than those who perished in Russia, where, it must be remembered, the Grande Armée was largely composed of foreigners, forced by Napoleon to assist in the realization of his dreams of conquest.

The French armies in Spain often suffered intense hardships. Among the most severe of their winter campaigns may be mentioned the passage of the Guadarrama when Napoleon was in pursuit of Sir John Moore. The snow fell in heavy flakes which a biting wind drove into the men's faces, blinding both them and their horses. The guns fell down clefts and precipices, the men broke their ranks, and lagged without order or discipline. Many officers and men died of cold and hunger. The author relates how on one occasion Napoleon, no longer able to ride, marched on foot at the head of a battalion, which, through suffering, had fallen into such a lax state of discipline, that many of the men openly urged each other to shoot him. Napoleon, unmoved, continued at their head, pretending not to notice their remarks. The next day the army descended into the plains where food and wine were abundant; the fickle soldiers who the day before had wanted to shoot him, hailed Napoleon with acclamations of fervid loyalty, which he, cynic as he was, must have accepted at their proper value.

The hardships of service during the heat of the Spanish summer, were only surpassed by the misery of campaigning in the depths of winter. On one occasion an infantry regiment marching through Castille in July, was lagging and dragging its weary way with ever increasing slowness. The Colonel, an officer of remarkable energy, was riding about, doing his utmost to keep his command together, and bitterly apostrophising the soldiers who had fallen out. One of the latter observed *sotto voce*, "the Colonel may well talk about closing up and pushing ahead, we could do the same if we each had a horse to ride." Hearing this, the Colonel, without any remark, dismounted, and drawing a pistol from his holsters, shot his charger on the spot, and for the rest of the campaign performed his duties on foot. His example produced the best results, and his regiment became famous for the small numbers who fell out on the line of march.

The author explains very clearly how, after Napoleon's departure in 1809, the French soldiers gradually grew apathetic and indifferent. The natural dash of the *fantassin* gave place to indiscipline, home sickness, and a feeling that the compaign was destined to end in defeat.

III

We learn much from these pages of the manners and customs of King Joseph, Napoleon's brother. He appears to have been the weakest and best natured of mortals, always defending his rebellious and treacherous subjects. Time after time, in action, he would beg that the Spaniards might be dealt with gently. "Mes bons amis," he would say to his French attendants, "epargnez-ces pauvres Espagnols. Un jour ils seront vos compagnons d'armes."

One of Joseph's first acts on ascending the Spanish throne was to abolish the monasteries. The young monks either joined various bands of Guerillas, or formed themselves into irregular corps retaining their monastic habits. The book is full of anecdotes of the ferocity of the Spanish monks, who not only refused to give absolution to the dying French, but even occasionally despatched them with their poignards.

The great difficulty of the French was to maintain their lines of communication with France. This duty was entrusted to a special corps of Gendarmerie, but detachments and convoys were constantly cut off and lost. On one occasion in 1808, the advanced guard of the army pursuing Sir John Moore towards Corunna, came across a fortified village over which the tricolour was seen to be flying. It appeared that 300 French soldiers cut off from their mainbody had sought refuge in the village, had and placed it in a state of defence. Often attacked, they had succeeded in repulsing every assault, and had obeyed their leader, a corporal, as implicitly as though he were the Emperor himself.

IV.

Bessieres, Gouvion Saint-Cyr, Jourdan, Junot, Lannes, Marmont, Massena, Mortier, Murat, Ney, Soult, Suchet, Victor, &c., were the Marshals employed by Napoleon in Spain. The operations of the campaign took place in Galicia, Navarre, Catalonia, Aragon, Castille, Estremadura, Valencia, Leon, Andalusia, and also in the kingdom of Portugal.

Not one of the three invasions of Portugal was successful. The first, that of Junot in 1808, was less disastrous in its results than the capitulation of Baylen, but it terminated in the convention of Cintra by which it was stipulated that the French troops should be taken back to France *in English ships*. General Thiébault, the chief of Junot's staff, has described this short campaign most vividly, and also gives an account of Napoleon's rage and indignation on hearing of its utter failure.

In 1809 Marshal Soult tried his luck in Portugal, and was forced to quit the country in haste, escaping with the greatest difficulty just as he was about to be surrounded and captured by the Duke of Wellington. Not only did he lose all his baggage and artillery, but having entered the country at the head of 23,000 splendid troops, he returned with only 18,000, in a state of complete disorder. 5000 of his men are said to have been killed by the Portuguese peasants and Guerillas.

In the following year Marshal Massena was appointed to the command in Spain, and a force of three army corps was placed under his orders, commanded by Ney, Junot, and Reynier, respectively, in order to drive the English from Portugal. He tried, but in vain, after traversing a country which had been systematically laid waste by the people, to capture the lines of Torres Vedras, behind which the English, securely entrenched, obstinately refused to give battle. Want and sickness soon demoralised the French troops. The villages were deserted, the grain burnt, windmills destroyed, and every wine cask empty. Unable to subsist their army, the French were again compelled to retire. The rear guard skilfully commanded by Marshal Ney, secured the retreat, pursued by an active enemy superior in numbers, commanded by Wellington in person, who was assisted by a population bitterly hostile to the French.

During the retreat from Portugal the disagreements which had long existed between Massena and Ney, assumed an acute form. Napoleon weary of their constant recriminations, first of all recalled Ney and sent him to Germany. Marmont, who was sent in his place to command the 6th Corps, shortly afterwards superseded Massena, who retired to Paris in disgrace.

In his campaign in Portugal, Massena, the victor of Zurich, proved himself unworthy of his own reputation. Prematurely aged, sickly, sulky, melancholy, avaricious, discontented, and jealous, the Marshal lost his former firmness and became vascillating and irresolute. Badly served and badly advised, he had no longer his trusty aide-de-camp, Sainte Croix, who had been his right hand man throughout the campaign of Wagram. He was invariably accompanied by a lady, who followed his fortunes in Portugal, and caused him great inconvenience on several occasions. In times of difficulty during the retreat he used to say to his aide-de-camp Marbot "what a blunder I have made in bringing this woman on service." It was through trying to force the society of this lady upon Marshal Ney and Generals Junot and Reynier at a dinner given to his staff, that these three officers were so greatly offended as to openly show their resentment.

V

Massena, however, was by no means the only offender in this respect. Numbers of women followed the army, accompanying their husbands and lovers. General Loison lived with two *danseuses* whom he had brought from Bordeaux. General Lefebvre was followed everywhere by a Parisian actress. All the civil officials, the officers of the garrisons, in fact all who were permanently stationed in one locality, had their little *menages*—sometimes respectable, at other times much the reverse.

In some regiments, French women, and occasionally Spaniards, followed the fortunes of officers and men. They travelled with the baggage, in carts, carriages, and on foot, not according to their own station or to that of their protector, but according to the military circumstances of the time. Their lot was by no means an enviable one. Besides being exposed at all times to the fire of the Guerillas and to the thousand risks of a military life, they ran the risk of falling into the hands of the Spaniards, and of undergoing nameless brutalities at their hands. Moreover if their husbands or lovers were either killed or disappeared, as not unfrequently happened, these unfortunate women, no matter how young or how beautiful, were reduced to a condition of the most pitiable misery. Nearly all the women who followed the army into Spain died of exposure or hunger. The *Memoires D'un Aide-Major* give a vivid picture of the sufferings of these unfortunates in the retreat from Andalusia.

Mention has been made of these incidents to show how war can blunt the feelings of even the most civilized nations. They also throw light on the relaxation of discipline which the long campaign had produced—a phase of military life which is studiously glossed over by historians. Many of the reverses suffered during the war were doubtless attributable to this want of discipline.

VI.

It was only the Emperor, with his iron hand, who could enforce among the Marshals complete obedience to his orders. Rivalries always existed between some of his Lieutenants. After Essling, in fact on the field of battle, Lannes and Bessieres were on the point of coming to blows when stopped by Marshal Massena. Marbot gives a capital account of the incident in his *Memoires*.

To maintain perfect discipline throughout the army, the presence of Napoleon was an absolute necessity. In Spain, Joseph had neither the force of character nor the military knowledge required to obtain from the Marshals complete and unquestioning obedience. Jourdan, the Chief of his Staff, was not obeyed by Soult, and when the latter himself succeeded Jourdan in 1809, he met with exactly the same opposition. In May 1812, Marshal Soult went so far as to refuse to obey the orders of King Joseph, tendered his resignation, which was refused, and then persisted in his disobedience. A short time before, Marshal Marmont had closed the gates of Talavera to the Councellor of State Amoros who had been sent by Joseph to hold an official inquiry regarding an illegal enforcement of requisitions to the value of over a million of francs. In 1810 Marshal Soult allowed Massena to spend several months before Lisbon, without sending him any reinforcements, although he knew that they were urgently required. In the same way he made no effort to assist Marshal Victor, who, left to his own resources, was compelled to evacuate Galicia. Marshal Bessieres at Fuentes d'Onoro declined to place Montbrun's cavalry at the disposal of Marshal Massena, the result being that instead of a victory, the English were permitted to make an orderly retreat of what should have properly been a rout. In Catalonia Marshal St. Cyr refused to act in combination with Marshal Suchet who was conducting a series of brilliant operations in Valencia. "If I had had two Marshals like Suchet in Spain," wrote Napoleon from St. Helena, "I would never have lost the Peninsula."

Jealousy and want of combination showed itself time after time in the course of the war. Suchet's conduct at the battle of Toulouse in in 1814, where he refused to cooperate with Soult, is deserving of the strongest censure, for he thus prevented the destruction of the British army at the foot of the walls of that town.

It must in fact be owned that disunion, stupidity, private rivalries, and personal interests, were the principal causes of the French failures in the Peninsula.

All these causes are minutely described by Blaze in his *Memoires.* The greater number of the junior officers and the rank and file did their duty loyally, but the bad example set by the principal commanders was unfortunately imitated by many of their subordinates.

It is clearly shown that the true cause of Dupont's capitulation at Baylen was the excessive amount of loot with which his force was encumbered. "Our little force," wrote an eye witness, "had more baggage than an army of 50,000 men. Captains and civil officials of the same standing had carriages drawn by four mules. Over fifty carts followed each battalion. All this was plunder taken from Cordova. The private soldiers were compelled to turn out their haversacks, but by a tacit agreement among the officers, certain waggons containing their own plunder, were passed by without any inquiry." Readers of Blaze's *Memoires* will learn the sad consequences of the possession of these ill gotten gains, and how the desire to keep them drove certain of the officers who were prisoners to commit acts of the most shameful and treacherous nature.

VII.

The efforts made by Soult to secure his nomination to the throne of Portugal in 1809, are little known. It may be interesting to briefly describe them.

During the second French campaign in Portugal, the Prince Regent and the Royal family sailed with many of the Portuguese nobility for Brazil, from which they did not return until 1820. Abandoned by the House of Braganza, the kingdom was under no regular authority. Was the country to become a British colony ? Ever since the Methuen treaty English influence in Portugal had gradually increased. The party hostile to the royal family then offered the throne to Marshal Soult. The latter welcomed their proposals with eagerness. He found them flattering to his pride, though his duty to the Emperor clearly indicated that it was undoubtedly his place to reject them. He allowed the Portuguese to address him as "Your Majesty," and tried to win over the army to his cause. But in the latter an opposition party was soon formed, at the head of which was the intractable General Loison and several other officers of rank.

The conspirators, determined to resist by every means in their power the royal aspirations of their General, determined to revolt, to secure Soult, and to lead back the army to France. They even went so far as to enter into negotiations with the English. The mystery which envelops this regrettable incident of the Spanish War, has never been really cleared up. Informed of the plots which the traitors were weaving around him, Soult ordered the arrest of Captain Argenton of the 17th Dragoons who had been sent as an emissary to Wellington. On being questioned, Argenton disclosed the names of his accomplices. Soult called them up one after the other, but all denied their complicity with loud protestations of fidelity. Nevertheless "Soult in his official report attributed this abortive revolt to the army being weary of a war such as was then waging in Spain"—an avowal of peculiar significance.

It would have been dangerous to throw too much light on the matter, and Napoleon was anxious to avoid a scandal. Argenton was made the scape goat, and was shot at Grenelle in 1809, cursing to his last moments "those accomplices who had so basely deserted him."

Napoleon took a dislike to Soult on account of his ambitious designs in Portugal, and at one time proposed to bring him to trial for treason. He however relented, and made him Chief of the Staff in Spain, in consideration of his former services more especially at Austerlitz.

The rest of the preface is devoted to an account of the character of the author, Sebastian Blaze, as gathered from certain adventurous incidents in his life and the opinion in which he was held by his brother officers. One of the latter, L. H. Fée, a Military Surgeon like himself, and who knew him intimately in Spain, describes his friend as follows—

"Among the comrades whom I met at Seville was Sebastian Blaze, who was really very different from what he appears to have been from his *Memoires* He was a fine singer, a great smoker, rather lazy and apathetic, and in speaking gesticulated and made faces like a true Castilian. If he had been dressed as a Spaniard, no one would have taken him for a Frenchman."

Nevertheless he was French to the core, and belonged to a family of Provence being the third son of Henri Sebastian Blaze, who was first of all a civil official and afterwards Notary at Avignon—employments which did not prevent him from being a talented musician, and even the composer of a comic opera. Another one of his sons was an officer in the Grande Armée, and, like his medical brother, has left interesting military Memoires.

The *Memoires* of Sebastian Blaze cover the four years from 1808 to 1813, during which he was employed in Spain as an officer of the Medical Service. The work was published in 1825 under the title of "Memoires of an Army Surgeon," and met with a most favourable reception. It is written in a free and easy style, and from the fact of the author being a disinterested non-combatant, forms a most valuable contribution to the history of the time.

Sebastian Blaze made no attempt at style or method. His reminiscences were gathered from his note books, and all through the work he makes no pretension to be writing history—he merely says "I was at a certain place, and there I met with certain experiences which I will now proceed to describe." He shows himself just as he was, with all his good qualities and defects; thus his boisterous southern gaiety his love of pleasure, and his readiness of resource, are all revealed to the reader, who will recognize in Sebastian Blaze many of the traits on the famous Gil Blas.

Blaze was attached to the military hospital at Madrid and was left there with the sick when the French evacuated the capital after the capitulation of Baylen. The French medical officers were treated as prisoners by the Spaniards under General Castanos, and on the approach of another French army were hurriedly removed to the south. Then commenced for the young medical officer—he was only just twenty—a cruel captivity which only terminated about three years later, when he regained his liberty by a daring escape from his prison. The march from Madrid to Seville was a sad one for the French prisoners, who were openly robbed at every halting place by the soldiers of their escort. The inhabitants of the towns and villages through which they passed not only greeted them with showers of stones, but even made repeated attempts to assassinate them. In spite of these hardships and dangers, Sebastian Blaze and his companions never lost their cheery good humour. At Albuquerque some Spanish ladies paid a visit to the prisoners in the citadel, and were received so agreeably that an impromptu dance was got up on the spot, which was only terminated by the appearance of their jealous husbands who forcibly dragged them away. On another occasion Blaze was elected master of the ceremonies at a dance given by some monks, and though he did not get the good supper which had been the chief inducement to his taking the appointment, he describes with characteristic gaiety the clumsy but vigorous gambols of the reverend fathers.

X.

These transient gleams of gaiety however are but rare. Badly fed, badly treated, regarded as heretics by a fanatical population, the unfortunate prisoners continued their weary march to Cadiz. Throughout these troubles Blaze contrived by ingenuity and readiness of resource to alleviate the hardships of his lot. At one time he acted as fiddler, at another as the maker of hair rings, as cook to his jailer, as a doctor, and even as a teacher of Italian—although he did not know one word of that language, and was perforce obliged to give his pupils elaborate instruction in his own Provencal dialect, which he successfully passed off as the true language of Danté !

The French medical officers were sent to Cadiz. There began a cruel life on the hulks. The harbour was full of these dismasted floating prisons. Sebastian Blaze was first of all confined with some soldiers on the "Terrible," but was afterwards transferred to the "Castile," a hulk allotted to officers. His next prison was in the isle of Leon, and then on the "Argonaut" from which, two years later, he made his daring escape. The pages devoted to a description of life on the hulks are of the greatest interest. One realizes the utter misery of the French prisoners crowded by the thousand into these old ships. The 25,000 men of Dupont's army which capitulated at Baylen, were all confined in this manner until sent to Cabrera from which few returned alive. The sick were numerous, but were totally neglected, and unprovided with medicines or attendance. On board the "Sovereign," one of the hulks, 15 or 20 men died daily, their corpses being thrown overboard without any religious ceremony. Provisions often ran short for several days, and the unhappy prisoners were tortured by hunger and thirst. Many naturally tried to escape, whereupon the Spanish officer in charge announced that every time that a Frenchman escaped, two prisoners, selected by drawing lots, would be hanged in the presence of their comrades, besides the fugitive, should he at any time be recaptured. Of the 25,000 French prisoners interned in the rocky island of Cabrera in 1806, only 1500 returned to France at the peace in 1814.

In the midst of these sufferings the French kept up their good humour and inexhaustible gaiety. Sebastian Blaze relates all the different ways in which the prisoners strove to forget their troubles. He tells us all about the life of these curious colonies, including their morals. Women were numerous, and were often disposed of by lotteries. Theatricals, concerts, and other distractions, helped to kill the long hours of their apparently hopeless captivity.

The constant topic of conversation among the prisoners was how to escape, but their plots were generally communicated to the Spanish authorities by traitors among themselves. At last Sebastian Blaze determined to make his escape, and it is with the greatest interest that we read the thrilling story of how the prisoners of the "Argonaut" regained their liberty. From their floating prison the unfortunate captives could see the French battalions, the French trenches, and the French flag. A land breeze would even bring to their ears the sound of the French drums and fifes. But though so near, an escape seemed more difficult than ever, for their guards had been doubled, and the vigilance of the Spaniards and English was incessant.

At last, after several unsuccessful attempts, on the 21st May 1810, in broad daylight, in the midst of a storm, when the fury of the waves made all hope of a successful escape apparently impossible, Blaze and his comrades determined to be free or to perish in the attempt. Each Frenchman rushed upon a Spaniard of the guard, disarmed him, and then drove the whole of the escort to the lower deck where they locked them up. The moorings were cut, and the hulk was allowed to drift slowly towards the land. Meanwhile the alarm had been given. The ships, forts, and the gunboats, all opened fire on the "Argonaut" which grounded on a sand bank. There the ship remained, exposed all the while to a terrific artillery fire which swept down the prisoners in scores. Night came at last, and then the fire ceased but an attempt to board the hulk was made by the crew of an English gunboat, which the prisoners beat off by the fire of the muskets which they had taken from their guards. At daylight the artillery fire was resumed, but the rising tide had floated the ship, which now rapidly drifted towards the shore. Meanwhile a well placed shell from an English vessel set fire to the hulk, and the few surviving prisoners were rescued with great difficulty by some French boats which put out to their assistance from the land. Among the survivors was our hero, Sebastian Blaze, who though badly wounded was picked up by a French launch.

XI

These interesting *Memoires* conclude with an account of the author's adventures in Seville during the three more years he spent in the country. He only left Spain after the battle of Vittoria, of which he gives a graphic and very truthful account. This portion of the book describes how popular the French soldiers became with the Spaniards and the impression made by their gallantry on the susceptible Spanish ladies.

Here our review must conclude. The *Memoires* are undoubtedly interesting, and written in a style which besides being attractive and easy reading carries with it a feeling of conviction and of respect for their brave and cheery author.

La Justice Militaire dans l'armée de terre en France et dans les principaux pays. By Audre Taillefer, Paris, Larose : Price 8 francs.

It is difficult to describe in a brief analysis the scope of this remarkable work which gives a masterly sketch of military law at all times and in all countries. The author gives an account of military justice (1) as administered in the Roman legions (2) as administered in all European countries from the fall of the Roman Emprie to the outbreak of the French Revolution (3) from the French Revolution to the present time. The reader is initiated in the procedure and administration of military law in Germany, Austria, Russia, Italy, Great Britain, the United States, Servia, Roumania, Greece, Belgium, Holland, and Switzerland.

The author lays great stress on the general inadequacy of the punishments awarded on service, and of the necessity for prompter repression of crime, without reference to courts-martial and other tribunals. His idea in fact, is to make the Provost Marshal a judicial as well as an executive officer, and to give him very great power. To an English soldier the proposal does not appear altogether sound.

Few men can be trusted with so much arbitrary authority, and it is against all English principles of fair play to deny to the accused every reasonable means of defending himself. The book however, is a valuable work of reference, and would be useful to some of our military jurists and give them an idea of how military law is administered in foreign armies.

Attack or Defence. seven Military Essays. By Captain Maude, p.s.c., late R. E. London : J. J. Keliher & Co.

ALL of these essays are reprints of articles which have appeared individually in magazines, but most of them are well worthy of the greater permanence which they will obtain by being published in book form. The main object of the author is to prove the great superiority of the attack over the defence, and most of the seven essays here presented to us are devoted to that subject. The three last essays deal with "The Rise, Decay, and Revival of the Prussian Cavalry," "Imperial Insurance," and "Economical Army Reform."

All three are worth reading, but, with the exception of the essay on Cavalry, scarcely worth reviewing. We shall devote some attention to this essay before dealing with the main subject of the book, viz. the offensive versus the defensive. The British cavalry is at length beginning to receive the serious attention of the authorities, and not before that attention was needed. Improvement has undoubtedly taken place within the last few years ; but the most optimistic cavalry officers will scarcely claim that it is in a satisfactory condition It enjoys small opportunities of practice in manœuvres, it has too few horses in proportion to men, its regiments are too weak, as a total, its numbers are small in proportion to the other arms, and finally there is a want, on the part of Generals, of an appreciation of the true cavalry spirit with respect to the effective employment of the arm on the field of battle. Indeed for many years the awe inspired by the breech-loader and an imperfect appreciation of the lessons of the American Civil War, relegated cavalry to an inferior position from which it is only now beginning to emerge. This emergence is due in large measure to the example and teaching of the Germans who never gave in to our craze as to the impotence of cavalry in the face of improved small arms. As a matter of fact, owing to the great moral effect of cavalry on all but the steadiest and most highly diciplined infantry, the excellence of the arms of the latter counts for less than might be supposed by those who have not closely studied the subject. Captain Maude draws attention to the curious fact that "whereas in the Seven Years' War Prussian cavalry broke almost all they rode at, fifty years later the cavalry of the same nation failed nearly invariably against the same infantry weapon." During the nine years following the peace, the Prussian cavalry was splendid in its efficiency. The Inspector-General was the celebrated Seydlitz, the men were in the prime of life, most of them with two or three campaigns to their credit, and the officers were young men who had won their promotions on the field of battle. Owing to the men being much of an age and in the prime of life, the vacancies by death and disease were insignificant and the annual requirements as to recruits small. Hence as the latter joined, they were handed over to a drill-sergeant per squadron. "It was not worth an officer's while to go and see half-a-dozen men drill." The young officers who joined from time to time felt that they could not presume to teach the war-worn veterans under them. These veterans did not, moreover, need much drilling, and laziness crept in. At the end of the war the officers and men were mostly of the same age. They therefore grew old together. The effect of age is greater on the German, especially on the upper classes, than on the Englishman. Captain Maude asserts that the German ages rapidly, and very few retain their figures and activity after forty. "When therefore Seydlitz died, and the junior Captains averaged some twenty years' service...the elderly gentlemen who commanded regiments and squardons found it easier to judge the efficiency of their commands in the *manège*, or by watching an occasional charge from a flank, than by riding in front of their men in the open field...In the old days charges were judged from the front; the men prided themselves on riding boot to boot....Accurate dressing was thereby rendered out of the question The charge was, as already stated, judged from the front, and if that was closed and unbroken everything was well. But when judging from the flank came in, the correct alignment began to be considered the main thing, and this could only be attained by allowing the ranks to open when the gallop sounded; and so it came to pass that the descendants and survivors of the old Frederician cavalry, attacking at the gallop, were ridden through and dispersed by French cuirassiers, who moved only at the "trot," but "closed up." Towards the end of Frederick's reign the Prussian cavalry had so deteriorated that the King administered some cutting reprimands, and Blucher was so disgusted with their conduct at Ligny that he wrote a very severe despatch on the subject. Matters became even worse during the long peace after Waterloo, and in the seven weeks' war of 1866 the shortcomings of the cavalry were numerous. In the winter of 1866-7 however, Prince Frederick Charles was appointed Inspector-General of Cavalry, and a new era began. When three years later the war with France broke out, the progress had been considerable, but the best proof of the growing efficiency of the Prussian cavalry was that the cavalry officers themselves admitted that "though with the material as it was they had done well, they had done nothing to what might have been achieved had a higher standard of training and greater uniformity placed better weapons at the disposal of the excellent spirit undoubtedly displayed by all ranks." Captain Maude lays great stress upon the fact that although all arms in the German army had displayed efficiency, yet that mistakes were made, shortcomings occurred, and faults of leadership took place. The idea that everything was perfect was a mistaken one, as foreign nations are slowly beginning to discover. The German military officials were aware of the fact from the first, and have earnestly striven for the last quarter of a century to secure improvement, in which they have succeeded to a marvellous extent.

We now come to the chief topic of the book before us, the relative advantages of the offensive and defensive. The author has displayed, in dealing with this subject, great ability and considerable industry. He strives conscientiously to be above all things practical, but he has not always succeeded. He is occasionally metaphysical, frequently in the various essays repeats himself, and there is throughout a tinge of that theory which so often taints the writings of "sapper" officers when dealing with the work of artillery and infantry. Still he is always instructive and suggestive, and in many instances impresses upon the reader sound practical principles. It is impossible to follow the author through his arguments and illustrations, profitable as the task would be, but want of space obliges us to confine ourselves to the principal points, and even these we can only touch on lightly. Curiously enough, considering his branch of the service, he sets little store on the art of fortification—either hasty field entrenchments, or more deliberately executed and elaborate works, There is much in what he says, though in our opinion he goes too far. Indeed, with regard to entrenched camps, he admits that there are cases in which they are justifiable. At the same time we are of opinion also that as a rule the money devoted to fortifications would be better spent on a field army whose victories in the open, and not their successful sieges, will in these days decide the fate of a campaign. We could however mention many cases in which a moderate amount of fortification is advisable. As to field works, or rather, hasty entrenchments, on a field of battle their use with discretion is surely to be advocated, for if they do nothing else they give the occupants confidence. But we must pass on to that part of the question which relates to the attack and defence of positions. The author's bias for the offensive is so pronounced that in discussing the subject he conducts himself rather like an advocate than a judge. There is no doubt that the offensive heightens the *morale* of troops, because it implies a superiority of some sort. It also possesses the advantage that the assailants in their advance leave behind the killed and wounded. The great advantage also attaches to the offensive that the attacking General can often—by no means always—leave the defending General in doubt, until too late to take the necessary steps, as to where the assault is to be delivered. On the other hand in a prepared position or even one that has been occupied for only a few hours, the defenders can ascertain and fix the ranges. The defenders have moreover no difficulty about the supply of ammunition, and they being stationary, with a bank or some support for their rifles, can fire more steadily and with greater effect than the assailants, whose nerves, after a fatiguing march and a rapid final advance, are firing at unknown distances. Captain Maude considers that the offensive has gained much by the introduction of breechloaders which enable men to load without standing up. He forgets however, that at all events a portion of the defensive line will be held by troops partially protected by either natural or artifical cover, and that allowing that the defenders are merely lying or kneeling down on unprotected open ground they are less exposed than the assailants when the latter rise to advance. In short, it may be asserted in general terms, that as a rule the defenders' infantry present far smaller marks than do the assailants' infantry. Again, the defenders having plenty of ammunition can, if they do not shrink from disclosing their position, commence and carry on their fire when the enemy are still distant. The assailants, on the other hand, have to economise their amunition and very wisely interrupt their advance by halting to fire as seldom as possible. But according to Captain Maude the assailants will be able to concentrate a much larger number of guns than can at first be massed to meet them by the defenders, and therefore will be so demoralising, seeing the enormous increase in the destructive power of artillery, that the defenders' guns will be silenced. and the defenders' infantry be demoralised before the actual assault. It occurs to us that Captain Maude has omitted to notice one or two qualifying circumstances. Owing to the enormous range of the present field artillery the defenders' guns for some distance on each flank of the space selected for attack will be able to take part in the artillery duel, Again, in spite of the appalling possibilities of modern guns and the fact that the pieces themselves have no nerves, we may hesitate to accept the dogma that the defenders' artillery will be soon crushed. The defenders will have ascertained the most likely position for the assailants' artillery and will to a certain extent have arranged to concentrate fire on them as soon as they appear The assailants' guns will not, especially if opening fire at a great distance, be able to hit off the range for a minute or two, Moreover the defenders' batteries will not be deliberately exposed to view but on the contrary be carefully concealed, and they need not betray their presence and position until they find that the enemy have got the range. Finally, a few picked shots thrown out in front, smokeless powder not indicating their position at a distance, would be able.—they would have the exact range remember—to somewhat shake the nerves of the enemy's gunners. Guns may have no nerves but gunners have, and nervousness will greatly affect the correctness of the laying and the adjustment of fuzes Hence artillery fired at, will not be so destructive as when practising unobstructed on the range. Captain Maude gets over all difficulties by assuming for the sake of argument four typical profiles of the front of a position, but he says little or nothing of the lie of the ground in rear of the position. He, for the purpose of pushing home his argument, assumes that the defenders occupy the summit of a slope with a well marked break 500 yards in front. The defenders' guns are on the crest, and are protected at the break of slope referred to by infantry in shelter trenches. Captain Maude insists that the infantry must be that distance in front to avoid premature bursts from their own shells. In rear of the guns, at from 600 to 800 yards' distance, according to the slope, are the supporting infantry. They must be at that distance, he says, to escape "overs." According to him it is an accepted fact that artillery on the defensive cannot protect their own front. We were under the impression that such was the not the case, that it was only the flanks of guns that were vulnerable. We understand that with a break of slope such as is here assumed some means must be adopted of preventing the enemy's infantry gathering and harassing the gunners, although as the guns are only to be seen when run forward to fire, the gunners would not suffer seriously. Still either that dead angle could be swept by flanking fire, or a weak line of infantry—armed with repeaters, be it understood—would suffice. Again the supporting infantry might under certain conditions of ground be able with comparative safety to be much nearer than 600 yards in rear of the guns. However, Captain Maude arranges his conditions to suit the desired results. Well! the guns are driven back by the superior artillery fire of the enemy. Hence the supporting line are compelled to advance at least 400 yards to aid their comrades in the shelter trench. Why they should thus advance under a heavy artillery and rifle fire we cannot imagine. We should have thought that the supporting infantry would advance only as far as the line where the trails of their guns rested and lying down aid the men in the trenches to check the advance of the enemy's infantry. If the men in the trenches—a weak line—found themselves unable to remain they would probably rush back by twos and threes at a time. But Captain Maude causes them to undergo a severe handling from cavalry concealed close at hand behind coppices, and taking them by surprise whilst their attention was distracted by watching the bursting of shells on the slope in their rear. Probably however the officers at least would watch against such a surprise. He also assumes that when the defenders' artillery retire they throw the supporting infantry into confusion. Surely here is a little too much of unfavourable hypothesis!

We should have liked to have written something in support of his argument in favour of the two-deep closed line for attack, but we have aready exceeded our limits. We must therefore refer the readers of this article to the book itself for Captain Maude's admirable remarks on formations for attack, and the justification of drill as a means of securing discipline in action—*Broad Arrow*.

A Text-Book of Indian Military Law. By Captain E. H. Bernard,
Cantonment Magistrate, Mandalay.
Calcutta : Thacker Spink and Co. Rs. 8.

Indian Articles of War. Revised up to date. By Major C. E. Poynder.
Calcutta : Thacker Spink and Co. Rs. 3-8-0.

We have received the above two works and can strongly recommend them to Indian Officers. Each supplies a special want. Captain Bernard's book includes besides the Articles of War, the Indian Penal Code, and the Indian Evidence Act, a carefully prepared statement showing the difference in procedure and evidence between English and Indian Military Law. It is a useful work of reference, though not free from errors, some of which are rather misleading. Rules of Procedure to be of any value must be issued by authority. The Rules contained in Captain Bernard's book are based, no doubt, upon the Rules of Procedure of the Army Act, but many of the conclusions arrived at are merely personal interpretations of the law, and should therefore be accepted with caution.

Major Poynder's book is perhaps less ambitious, but more useful to officers reading for their promotion examinations. It has a good index, is well arranged, and is likely to displace all other rivals as *the* text-book for Garrison Classes.

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UNITED STATES.—*Journal of the United States Cavalry, March*:—Cavalry in Modern War.

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FRANCE.—*La France Militaire, 27th May*:—The feeding of troops.

Memorial de l' Artillerie de la Marine, 2nd number of 1896:—Military History of the Revolution in San Domingo.

Le Progres Militaire:—Revised Scheme for a Colonial Army.

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GREAT BRITAIN.—*Army and Navy Gazette*: The Indian Army of to-day—Difficulties of Defensive Tactics and how to overcome them.

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Revue Militaire d l' Etranger:—The Italians in Africa—Military resources of Greece.

GERMANY.—*Militarisches*:—A landing in England.

Neu Militarische Blatter:—June. The importance of Delagoa Bay.

GREAT BRITAIN.—*United Service Gazette*:—June. Our military preparations against invasion.

SWITZERLAND.—*Schweizerische Monatschriff, May*:—Gunshot wounds and first aid to the wounded on the field of battle.

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JOURNAL

OF THE

United Service Institution of India.

Prize Essay, 1895-96.

The Subject of the Prize Essay for 1895-96 *was*—

"ON THE IMPROVEMENT OF THE PRESENT TRANSPORT ORGANIZATION IN INDIA.

THE Council of the United Service Institution of India has awarded the Gold Medal of the Institution to Captain A. H. Bingley, 7th (D. C. O.) Bengal Infantry, the writer of the Essay submitted under the motto: "*Non vi sed semper cadendo.*"

THE Referees chosen by the Council were—

- Major-General A. R. Badcock, *C.B.*, *C.S.I.*, Quarter-Master-General in India.
- Brigadier-General, W. F. Gatacre, *C.B.*, *D.S.O.*, Commanding Quetta District.
- Brigdier-General E. R. Elles, *C.B.*, Commanding Lahore District.

On the recommendation of the Referees, the Council has decided to publish six of the Essays submitted, selected on account of the valuable suggestions they contain. Two are published as a supplement to the July Journal, and the remainder will appear in the October and December numbers. *The Essays will not be arranged in order of merit*, but in such sequence as may seem most desirable.

THE JOURNAL

OF THE

UNITED SERVICE INSTITUTION OF INDIA.

SUPPLEMENT, *JULY*, 1896.

THE IMPROVEMENT OF THE PRESENT ORGANIZATION OF TRANSPORT IN INDIA.

PRIZE ESSAY.

By Captain A. H. Bingley, 7th (D. C. O.) B. I.

Motto:—"*Non vi sed semper cadendo.*"

CHAPTER I.

Supply of attendants.

> "It is much more easy, and there are more means and facilities to form Infantry and Cavalry soldiers in a hurry than to form military drivers. If they are not regularly trained and formed, no reliance can be placed on them; and yet the most important operations of war depend frequently on the due performance of their duty by this description of corps."—Wellington.

It has been laid down by nearly all our most eminent military authorities, that transport, to be efficient, must be organized on a distinctly military basis. "I am convinced," wrote Sir Charles Napier, "that in India the baggage of an army can never be rendered properly movable, unless it is formed into a corps perfectly organized." Regularity on the march can only be secured by practice, and by conforming to certain rules. In regiments this practice forms part of our drill, and to obtain the same regularity in the long transport columns which encumber the rear of an army, suitable regulations must be framed for their guidance, and these can only be obeyed by a body accustomed to discipline. "The mere hasty collection of animals," says Sir John Adye, "never can constitute an effective transport."

An army in the field requires two descriptions of carriage—

(1) The *1st Line* which actually accompanies the troops.

(2) The *2nd Line* which moves in rear of the zone of active operations, and brings up supplies from the base to the front.

The *1st Line* consists of (*a*) the regimental transport which conveys the baggage, camp-equipage, entrenching tools, and reserve ammunition; (*b*) the departmental transport which brings forward supplies for a limited number of days, and provides the carriage required for the staff, field hospitals, and other necessary services. It forms as essential a portion of the force as its Infantry, Cavalry, or Artillery, and to be efficient must be organized in regular disciplined units, composed chiefly of mules and camels as it is required to keep pace with the troops.

The *2nd Line* is worked on the staging system, generally out of reach of the enemy, and brings up the supplies of the army from the base to the magazines and advance depôts. The number of animals required will depend upon the number of stages on the road; but in any case it will consist chiefly of hired animals and carts, in charge of civilian attendants, but controlled by the Transport Staff. Rapidity of movement being a secondary consideration, this portion of the transport, instead of being composed entirely of pack-mules and camels, may include ekkas, bullock-carts, camel-carts, donkeys, camels and elephants, supplemented whenever possible by light railroads, tram-lines, and boats or rafts.

In India, the exigencies of our political situation render the maintenance of large obligatory garrisons indispensable, thus placing a limit on the size of the force which could be spared for operations beyond our frontiers; it is the more essential therefore, that this force should be able to take the field at the shortest notice. To attain this object, and to ensure that mobility which is essential to successful action, we must maintain, even in peace, not only an establishment of regimental transport sufficient for our whole field army, but also a number of *cadres*, capable of rapid expansion by the hiring of animals and drivers, which, when mobilized, would provide the carriage required for the conveyance of supplies on the lines of communication, and the equipment and stores of the Medical, Telegraph, and other departments of the army. The transport resources of India are enormous, but the statistics on the subject are vague and unreliable, and to make this wealth of animals more available for military purposes, we require a careful system of registration, and a few simple enactments legalizing the impressment of carriage.

Under the present organization our permanent peace transport consists roughly of 14,000 pack-mules, 1,500 draught-mules, 3,500 camels, 3,000 siege-train bullocks, 3,000 draught-bullocks, and about 3,000 carts of various kinds. This is distributed partly at depôts and partly with regiments, the corps provided with transport being those stationed in certain localities considered as of special strategical or political importance. The animals, except some of the camels which are hired, are the property of Government, while the drivers are enlisted employés of the Indian Commissariat.

The force in Chitral which was little more than a division of all arms, gave employment to some 35,000 pack-animals, besides the Jaipur and Gwalior Carts Trains. If this is taken as an estimate of the requirements of future wars, each army corps would need about 90,000 animals, and the force of two army corps and a reserve division, which is generally regarded as the largest we could possibly put into the field, would demand over 200,000 animals and a large number of carts.

Now it is perfectly evident that the maintenance of such a huge establishment in peace-time is simply out of the question. Apart from the enormous expense which it would involve, it would be impossible to find employment for such a large number of drivers and animals. We must be content with a peace establishment of about 50,000 camels, mules, ponies, and bullocks, capable by a careful system of registration and subsidies of being expanded to the required dimensions in war.

The secret of success in any system of mobilization is that *the cadres maintained in peace should be stationed in the districts from which they draw their reserves in war.* This applies as much to animals as to men, and it is therefore essential that our Transport Circles should be placed in those localities which supply them with drivers, camels, and mules. Each Circle, moreover, must have its own reserves of saddlery, equipment, gear, and clothing, so that on a call to arms the business of mobilization may be carried out smoothly and efficiently without any dependence upon a central authority. It was this decentralization and independence of head-quarters that enabled the Germans in 1870 to mobilize 447,000 men in eleven days, while the French, through a faulty system of administration, failed to concentrate their army in eighteen, and had eventually to take the field with insufficient supplies, and a transport which proved utterly inadequate.

Political and strategical considerations have necessitated the concentration of most of our forces on the North-West Frontier, and as a necessary consequence the greater proportion of our transport is now stationed in the Punjáb and Balúchistán. This circumstance greatly facilitates mobilization, for, as nearly all our camels and mules are bred in those provinces and most of our attendants are Patháns and Punjábis, the majority of our transport units are thus stationed in their own recruiting ground. If we wish, however, to establish a system by which the Transport Department may be brought into closer touch with the great civil sources of supply, *we must give it a territorial as well as a military organization.* India must be divided into Transport Circles, each with head-quarters at a convenient station, and the units belonging thereto must be dependent on their Circles for reserves of men and animals. Not only should their *personnel* be recruited therein, but all camels, mules and ponies, required for their establishments, should be locally purchased or hired, and a connection thus established between the Circle Transport and the local *Zamindar,* without the intervention of a Commissariat-contractor. Landholders, by having a market for the sale and hire of their stock in the immediate vicinity of their homes, would be encouraged to devote more attention than they do at present to the breeding of mules and camels.

Under the scheme suggested, India would be divided into 24 Transport Circles as shown in the map attached. In peace-time each Transport Circle would maintain the *cadres* of a certain number of organized baggage-corps, each of which would be capable of expansion to three times its strength in war. The composition of these corps would vary according to the resources of the districts from which they recruited. Thus in the Punjáb, Balúchistán, and the North-West Provinces, it would be advisable to maintain camels and mules; in Scinde and Rájpútána the establishment might consist of camels and ponies; and in Madras and Bombay chiefly of bullocks

For the sake of illustration let us suppose that the Rawal Pindi Circle includes two Mule and two Camel Corps. The Circle staff would consist of—

1 Officer (not below the rank of Captain) as Circle Commandant.
1 Officer as Adjutant.
1 Honorary Commissioned Officer as Quarter-Master.
1 Sergeant-Major.
1 Veterinary subordinate.
4 Clerks.

Each corps would comprise—

3 Officers.
3 Staff-Sergeants.
3 Native officers.
12 Duffadars.
120 Drivers.
3 Salutris
6 Nalbands.[*]
3 Mistris.
3 Mochis.
3 Blacksmiths.
3 Clerks.
360 Mules,[†] camels,[†] or bullocks.
60 Mule-carts, 60 camel-carts or 180 bullock-carts.

The above would be organized in three troops, each of four sections. For war, each of these troops would be expanded, by mobilizing 80 reservist-drivers and 240 registered animals, into a corps consisting of—

1 British officer.
1 Staff-Sergeant.
1 Jemadar.
4 Duffadars.
120 Drivers.
1 Salutri.
1 Nalband.
1 Mochi.
3 Blacksmiths.
1 Clerk.
360 Mules, camels or bullocks.

In other words the Transport Corps organized on the lines described would form the nucleus of three corps in war. The full establishment of officers and non-commissioned officers would be available at all times, and the extra animals and attendants required to bring each troop to war strength, would be obtained by collecting the registered mules and camels of the Circle, and mobilizing its reserve of drivers. Each corps would take the field with one trained driver to every two reservists, and the latter, like the camel-men of Sir Charles Napier's Scinde Baggage Corps, "would be forced at once into strict compliance with the system of the corps which only requires obedience to orders, *i. e.*, discipline rather than drill." An account of the system on which this reserve would be organized will be found in Chapter III.

The whole of the saddlery, equipment, harness, gear, and carts, required for the mobilized establishment, would be stored at the Circle head-quarters, together with the clothing and accoutrements of the reservist-drivers. It would be well also to keep up a supply of special field service clothing sufficient for the total strength, so that on mobilization each Circle would be able to equip its Transport Corps independently of the Clothing and Ordnance Departments.

The staff of artificers would be sufficiently liberal to allow for the maintenance of efficient workshops, and each Circle should be able to carry out all necessary repairs to its carts, saddlery, harness, and equipment. There should also be a good tailor's shop in which the drivers' clothing could be made and repaired. The want of such an establishment is now much felt.

So long as drivers are willing to enlist in the Transport at existing rates, it is useless to suggest any increase to their pay. Ordinary justice, however, demands that they should be allowed a few privileges in the matter of pension. At present a driver *may*, after 30 years' service, *be recommended* for a compassionate allowance of Rs. 4 per mensem; but a man invalided after 21 years' work would only be entitled to a gratuity of 6 months' pay of rank. Considering the risks to which they are exposed on service, it is only fair that drivers should be given wound, injury, and family pensions, under the same rules as obtain for the Native Army. High retiring pensions are out of question, but Rs. 3 per mensem after 21 years' continuous service would make no appreciable difference in the Army Estimates, and this, and more liberal leave-rules, would go far to make enlistment in the Transport more popular. Other small concessions are also desirable, such as the issue to each man of more clothing of better quality, including a good great-coat or waterproof.

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[*] Nalbands would only be required in Mule and Bullock Corps.

[†] 180 mules or camels for draught, and 180 for pack purposes.

The suggested distribution and composition of Transport Circles is shown in the accompanying table:—

No.		NAME OF CIRCLE.	COMPOSITION.			REMARKS.
			Mule or Pony Corps.	Camel Corps.	Bullock Corps.	
Punjáb Command.	1	Peshawar ...	1	2*	...	*These camels should be hill animals if possible, procured from *Powindahs* or the tribes of the frontier.
	2	Dehra Ismail Khan...	1	2*	...	
	3	Dehra Ghazi Khan...	1	2*	...	
	4	Rawal Pindi ...	2	2	...	
	5	Mian Mir ...	2	2	...	
	6	Umballa ...	2	2	...	
Bengal Command.	7	Meerut ...	1	1†	...	† Mule-breeding being a recent industry in these districts, the establishment might be half ponies and half mules.
	8	Bareilly ...	1	1†	...	
	9	Agra ...	1	2†	...	
	10	Allahabad ...	...	...	1	
	11	Jubbulpore ...	...	...	1	
Bombay Command.	12	Nagpur ...	...	...	2	
	13	Mhow ...	1	1	...	
	14	Neemuch ...	...	2‡	...	‡ These Circles would tap the great camel country of Northern and Central Rajputana.
	15	Ajmere ...	...	2‡	...	
	16	Deesa ...	...	2‡	...	
	17	Poona ...	1	...	2	
	18	Jacobabad ...	1	2	...	
	19	Hyderabad (Scinde)	1	2	...	
	20	Quetta ...	1	1§	...	§ Hill camels if possible.
Madras Command.	21	Secunderabad ...	...	...	2	
	22	Bangalore ...	...	...	2	
	23	Burma ...	3‖	...	...	‖ One corps composed of Panthäys.
	24	Jalna (Dekhan) ...	...	...	2	
		TOTAL ...	*20	†28	‡12	
			60 Corps.			

Peace Establishment.

	Mules.	Mules.
* 20 Corps of 360 each =	...	7,200
	Camels.	Camels.
† 28 Corps of 360 each =	...	10,080
	Bullocks.	Bullocks.
‡ 12 Corps of 360 each =	...	4 320
TOTAL, 60 Corps.	TOTAL ANIMALS,	21,600

War Establishment.

	Mules.	Mules.
* 60 Corps of 360 each =	...	21 600
	Camels.	Camels.
† 84 Corps of 360 each =	...	30,240
	Bullocks.	Bullocks.
‡ 36 Corps of 360 each =	...	12,960
TOTAL, 180 Corps.	TOTAL ANIMALS,	64,800

It will be seen that the scheme provides for 60 transport *cadres* and it is proposed that 20 of these should be mobilized annually. The registered animals and reservist-drivers would thus come up for two months' training once in every three years. The first month would be spent in preliminary drills at head-quarters, and the second at a Camp of-Exercise, in a movable column, or with regiments moving in relief. In this manner the reserve would receive a practical training which would add greatly to its efficiency when embodied for field operations.

The Circles would be schools of instruction for training officers and non-commissioned officers in the care and administration of *regimental* transport. The course would last six months, half the time being spent with a Mule Corps, and the remaining portion with camels. There should be a preliminary examination at the end of the first three months, and students unable to satisfy the test should be summarily remanded to their regiments. The final examination should be searching and comprehensive and should include a simple *colloquial* test in Punjábi or Pushtu, in addition to the usual subjects, as a Transport officer unable to converse with his men in their own language can be of very little use on service.

Circle Commandants would enlist reservist-drivers; they would register and carry out the valuation of animals in conjunction with the civil authorities; they would purchase all Transport-animals required for their own and regimental establishments; they would prepare accurate statistics of the transport resources of their Circles; and by constant touring in the districts in company with the civil officials and officers of the Civil Veterinary Department, would endeavour to establish friendly relations with owners without the intervention of obnoxious middlemen, such as the Transport-chowdries and gomástas, to whose grasping and unscrupulous ways the unpopularity of the Commissariat Department may be chiefly attributed.

Two, if not more of the Burma Mule Corps might be recruited with great advantage from the Pantháys, or Muhammadan Chinese of Yunnan, who have settled in the Shan Hills, within the British border. They are ideal muleteers and furnish the greater part of the transport employed by our columns in Burma. Hitherto they have been unwilling to enter our service, except for temporary employment; they are now, however, enlisting in the Military Police, and with a little tact and persuasion could probably be induced to enrol themselves in the Transport, bringing their own mules with them. The cultivation of this recruiting ground is a matter of the utmost importance, for India's resources in mules are limited, and it would be a great relief to the market if Burma could provide for her own requirements.

With transport organized in the manner proposed, we should have a war-establishment of 64,800 animals with a proper proportion of drivers, which would be nearly sufficient for the lines of communication and for the departmental portion of the *1st Line* Transport of the army.

We will now proceed to describe the organziation of the transport of regiments.

Regimental Transport.

"Self-interest," wrote Sir Charles MacGregor, "is after all the mainspring of successful action, as with men so with regiments, if it is clear that it would be to the interest of a corps provided with its own transport to keep it in efficient order, it seems folly not to so provide it; for as without its transport a regiment cannot advance to that fame and glory which even the most prosaic of us look to, by giving a battalion its own animals to look after, we surely have as powerful a lever wherewith to ensure its hearty co-operation in their efficiency, as anyone could well devise."

Now the "hearty co-operation" above referred to, can never be secured by attaching to a regiment a mob of mules, and crowd of newly-raised drábis, on the eve of its proceeding on service. If we want efficiency, *complete regimental transport must be permanently attached in peace to those corps which would be the first to be mobilized for war.* The half-transport now allotted to certain regiments is but a sorry makeshift, granted on the principle that "half a loaf is better than no bread," with nothing to recommend it but economy.

It will be noticed that the regimental transport allotted to corps, with the exception of Mountain Batteries and Native Cavalry, all consists of mules and mule-carts. Light transport-carts will go over any ground passable by Field-Artillery and it should therefore be possible to use them anywhere except in small expeditions in roadless and mountainous countries. There the draught mules would have to be used for pack, and, if they proved insufficient, could always be supplemented by animals temporarily borrowed from corps not employed at the front.

British Cavalry.

A regiment of British Cavalry maintains a peace establishment of 280 syces, which on mobilization is reduced to 61. Our proposal, therefore, is that 3 jemadars and 72 of these syces should be turned into drivers, and placed in charge of the 200 mules and 71 carts forming the regimental transport. In the hot weather they might be replaced by entertaining an equivalent number of extra syces, but in the cold season, the latter might well be dispensed with, as too many servants make our soldiers lazy, and a little more work would be advantageous to their general health.

A Transport establishment recruited from this source would undoubtedly prove very efficient. The men would all be in the habit of working with British non-commissioned officers and soldiers, and they would be thoroughly disciplined and accustomed to the care of animals. From daily intercourse with the troopers at stables, the syces nearly all understand a little English—an important qualification in a British corps where knowledge of the vernacular is scanty.

The yearly cost of the Transport establishment would be—

		Rs.
Staff pay of 75 syce-drivers @ Re. 1 per mensem	=	900
Pay of 75 extra syces for six months @ Rs. 5 per mensem	=	2,250
Staff pay of Regimental Transport officer @ Rs. 50 p. m.	=	600
Ditto of 2 Transport Sergeants @ Rs. 10 per mensem	=	240
Ditto of 2 ditto Corporals @ Rs. 5 do.	=	120

GRAND TOTAL, Rs. 4,110 per annum.

Wheeled Artillery.

A similar arrangement might be adopted in the Horse and Field-Artillery, but as both already maintain an establishment of 12 native drivers per battery, it would perhaps be better to raise the latter to 42, and place them in charge of the 60 mules and 25 carts forming the battery transport.

The yearly cost of this establishment would be :—

	Rs.
30 Drivers at Rs. 9 per mensem ... ... =	3,240
To this must be added the staff-pay of a Bombardier as Transport Superintendent @ Rs. 6 per mensem =	72
GRAND TOTAL, Rs. 3,312 per annum.	

Mountain Artillery.

The Mountain Artillery enjoys the distinction of being the most mobile arm of the service. But though a number of baggage-animals forms part of its permanent establishment, considerable additions must be made on mobilization. By adding 30 drivers and 83 mules to each British battery, and 20 drivers and 56 mules to each Native battery, our Mountain Artillery would be able to take the field, literally at a moment's notice. This proposal involves no change beyond a most necessary increase in the *personnel* of each unit. The 30 extra drivers of each British battery would cost annually, @ Rs. 9 per mensem, Rs. 3,240, and the 20 extra drivers of a Native battery, at the same rate of pay, Rs. 2,160.

British Infantry.

The existing system by which regimental transport is attached to certain battalions of British Infantry has been found to work so well, that little can be suggested for its improvement. We should, however, maintain *complete* instead of *half* establishments.

As the transport should be trained to work entirely under British non-commissioned officers, the so-called "jemadars" might well be dispensed with, and the native *personnel* limited to a havildar-major, 4 havildars, 4 naicks, and 84 drivers. The latter would be recruited entirely from Frontier and Punjábi Muhammadans and certain low-caste Sikhs, such as ***Mahtons***, ***Lobanas***, and ***Chuhras***.

Regimental baggage on service may be divided into three categories—

(I) Absolute necessaries, *i.e.*, reserve ammunition, entrenching-tools, water pakhals, great-coats, cooking-pots, medical equipment, and kajawahs for spare arms.
(II) Blankets, water-proof sheets, officers' baggage, and men's kits.
(III) Tents and Quarter-Master's stores.

The first will comprise everything wanted for a battle or a bivouac; the second, the additions required to convert the bivouac into a camp without any superfluity of comfort; and the third, the necessaries indispensable for keeping the field, in health and comfort, for an indefinite period.

To convey the above, the following transport would be required to be allotted in the proportions noted.

For (I)—105 pack-mules carrying 200 maunds.

For (II) & (III)—178 draught-mules or ponies, and 83 carts carrying 680 maunds.

Total, 283 mules and 83 carts.

The annual cost of the Transport establishment of each battalion would be—

		Rs.
1 Havildar-Major @ Rs. 10 per mensem	=	120
4 Havildars @ „ 9 „ „	=	432
4 Naicks @ „ 8 „ „	=	404
84 Drivers @ „ 7 „ „	=	7,056
Staff-pay of Regimental Transport officer @ Rs. 50 per mensem	=	600
Ditto 2 ditto Sergeants @ „ 10 „ „	=	240
Ditto 2 ditto Corporals @ „ 5 „ „	=	120
GRAND TOTAL,		Rs. 8,972

Silladar Cavalry.

In the Silladar Cavalry a baggage-pony or mule, with a grass-cutter to act as a driver, is maintained by every two sowars for the conveyance of their kits and tent, and the Pioneer equipment is carried on four spare troop-horses, one being told off from each squadron. But though the 207 regimental mules or ponies are sufficient for the carriage of the men's baggage, 87 more are required for the conveyance of the baggage of British officers, followers, medical equipment, the field-forge, office, and Quarter-Master's stores, &c. Under existing arrangements these 87 mules and their attendants belong to the Commissariat, but are attached to the regiment for employment on the grass-farms. The system works fairly well, but the mules would cost less and would be infinitely better looked after if they were actually the property of the corps.

Service in the Silladar Cavalry is now so eagerly sought for that every regiment has numbers of *umédwars* on its lists, waiting for the occurrence of a vacancy. Many who would be only too willing to enlist are unable to do so through their inability to produce the *assâmi* demanded, while others who have the necessary means, are rejected as being under the standard height. It is proposed, therefore, that the establishment of each Silladar Cavalry regiment be increased by 30 sowars, who would be especially told off for transport duties. The Transport-sowars would be paid at the rate of Rs.30 per mensem and would each maintain three mules or ponies. The Commissariat, on an average, pays Rs.150 for each mule, but it is well known that the same animal when purchased by a Native officer can generally be secured for Rs.100 to 120. Each set of saddlery and gear required for a pack-animal costs about Rs.30, so the total cost of 3 mules or ponies including their equipment, may be put down at Rs. 400.

On joining, each Transport-sowar would pay an *assâmi* of Rs. 150, and the balance of Rs. 250 would be recovered from his pay in about four years, by monthly deductions of Rs.5.

The cost of feeding a mule is about Rs. 5 per mensem, so each Transport-sowar would be required to pay Rs. 15 a month for the maintenance of his three animals, and in addition a subscription of Re. 1 to the Chunda Fund to cover the cost of replacing worn-out animals, and renewing and repairing saddlery and equipment. This would leave him Rs. 9 to live upon, and at the end of four years he would clear Rs. 14 a month besides any good-conduct pay he may have earned meanwhile. On taking his pension or discharge, he would receive a refund of the value of his mules and equipment, in the same way as any other sowar.

It would be well for these Transport-sowars to maintain mules if possible, for they are generally preferable to ponies, nevertheless the grass-cutters' tats are not to be despised, as these poor animals, though badly fed and little looked after, make long marches with heavy loads, and generally come into camp not long after the regiment. A good baggage-pony is in fact little inferior to a mule, but being more liable to galls and sore backs, requires greater attention, and must have a well-stuffed saddle, carefully fitted and adjusted. A useful pony for transport purposes is more easily obtained, and can be bought at a lower price than a mule; it might therefore be advisable to allow a certain number of Transport-sowars to maintain the former in lieu of the latter, making a proportionate reduction in their *assámi*. If hill-ponies could be procured, it is probable that they would be found the best. Regimental Transport-animals should all be broken into harness, and five Transport-carts should be kept up—one for each squadron, and one for head-quarters—so as to be available for use whenever the country was suitable.

Transport-sowars could be obtained for Rs. 30 a month with but little difficulty from among the relations and friends of the men now serving in our regiments. It would in fact be a popular service, and the adoption of this system would be welcomed by most Commanding Officers as it would make their regiments absolutely independent of the Commissariat. The cost of 30 extra sowars maintaining 90 mules would be Rs. 10,800 per annum. The average cost of keeping 3 Commissariat mules and paying their driver is about Rs. 480 a month, so 90 mules and 30 muleteers would come to Rs. 14,400 per annum, *i.e.*, about Rs. 3,000 more than the suggested regimental establishment. Silladar transport would thus cause a distinct saving, besides being far more efficient.

Native Infantry, Pioneers, and Sappers.

The Infantry of the Native Army is now organized into groups of two or three linked battalions, the men of which are liable to be transferred from one to the other on emergencies. One battalion of each group is always stationed at the regimental centre, where, in the event of war, it would act as a feeder to those engaged in the field. Except in a campaign of the first magnitude, it is unlikely that more than one battalion of a group would be employed on service at a time, and it may therefore be accepted, as a rough rule, that the mobility of this arm would be fully provided for by allotting one complete

Transport unit to each of the 46 regimental centres,[*] the 7 Pioneer battalions, and a proportionate establishment to each of the 16 companies of Sappers. An exception is made in the case of the last two descriptions of corps as it is considered that they should always be maintained completely equipped for service.

No one who has served in the Kachin country, or on the North-East Frontier of Burma, can have failed to remark that where the Government mules with their hired drivers, rapidly succumbed to sore backs, the hired animals belonging to the Pantháys, and in charge of their owners, nearly always remained in a perfectly-efficient condition. The fact is that no amount of supervision will prevent a hired attendant, with no personal interest in the state of his animals, from neglecting both them and their gear. Some, in fact, will do so wilfully, looking forward to a spell of ease, while their charges are under veterinary treatment in the sick-lines. The only way to ensure genuine care and solicitude is to work upon the driver with the lever of self-interest, by making him, like the Panthay, the actual owner of his mules, and paying him *pro ratâ*, according to their fitness for duty. In other words we must organize the regimental transport of our Native Infantry on much the same system as that previously suggested for the Cavalry.

Dividing the baggage of a regiment of Native Infantry into three categories, as suggested for a British battalion, we require :—

(*a*) 84 pack-mules to carry the absolute necessaries which accompany the men under fire.

(*b*) 130 draught-mules (or ponies) and 62 carts to convey the remainder of their baggage and tents.

To provide this establishment it is proposed that a Transport unit should be permanently stationed at each regimental centre, and attached in peace to the battalion of the group, quartered there for the time being. In war it would furnish the transport of the battalion proceeding on service.

In order to provide for the *personnel* of this unit without an actual increase to the army, a reduction of 26 sepoys would be made in the strength of each battalion; but in order that there might be no diminution in the number of sepoys available for service, the reservists of the group would be increased from 218 to 296

To make this clearer, let us suppose that the 46th, 47th, and 48th P. I. are linked battalions and that Hissar is the centre of the group. The 46th and 47th are at Sialkot and Karnaul, and the 48th, with the transport, is at Hissar. War is declared, and the 46th is mobilized for service. The transport is at once despatched from Hissar under a British officer, either to Sialkot, or direct to the point of concentration at Peshawar, or, if preferred, it might pick up the regiment at Wazirabad or some convenient station *en route*.

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[*] Punjab, 15 centres; Bengal, 10 centres; Madras, 10 centres; Bombay 9 centres; Hyderabad Contingent, 2 centres.

Each Regimental Transport unit would be composed of:—

1	British officer ...	(From the battalion at the centre.)
1	Jemadar ...	To be borne as supernumeraries on the muster-rolls of the battalion at the centre.
2	Havildars ...	
2	Naicks	
27	Sepoy-drivers ...	... ... ditto.
1	Salutri	All enlisted ... ditto.
1	Nalband ...	
1	Mistri	
2	Mochis	
1	Clerk	
214	Mules and ponies.	
62	Light Transport-carts.	

The above establishment would allow for a driver to every 3 animals, without counting the non-commissioned officers. All would receive their ordinary Infantry pay, plus Transport allowance of Rs. 20, conditionally on their maintaining three mules or ponies together with complete saddlery and gear. The jemadar's allowance might be cut down to Rs. 7, as he would only be required to maintain a pony and saddlery for his personal use.

The average cost of three mules may be put down at Rs. 300, and their saddlery and gear would cost Rs. 100 more, or, say, Rs. 400 in all. Each sepoy-driver on joining would pay an *assámi* of Rs. 100 to the Transport Chunda Fund, and would find security for the balance of Rs. 300, which would be recovered by monthly instalments of Rs. 4 from his pay.

The Chunda Fund would be managed in exactly the same way as in the Silladar Cavalry. Each sepoy-driver would pay a monthly subscription of Re. 1, plus Rs. 15 for the feed of his three animals. This would absorb the whole of the Rs. 20, but would leave him as well off as the ordinary Infantry soldier, with the advantage that at the end of about six years he would be drawing Rs. 5 a month more, besides being a capitalist with property representing Rs. 400, which would be refunded to him on his taking his pension or discharge. The subscription to the Chunda Fund would amount to *77 × 12 = Rs. 924 per annum, which would amply cover the cost of renewing and repairing saddlery, and purchasing new mules and carts. Mules can be worked from 4 to 25 years of age, so with the careful treatment they would receive, renewals should not be very frequent. To start the fund, a loan would be required from Government, which would be repaid by gradual instalments; but after this the establishment would be self-supporting, and its cost would be limited to Rs.24,392 per annum, and made up as follows :—

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* 1 Native Officer, 2 Havildars, 2 Naicks, 72 Sepoys,—total 77.

			Rs.			Rs.
1	Native officer ...	@	57*	per mensem	=	684
2	Havildars ...	,,	36*	,,	=	864
2	Naicks ...	,,	34*	,,	=	816
1	Bugler ...	,,	9	,,	=	108
72	Sepoy-drivers ...	,,	20	,,	=	17,280
1	Nalband...	,,	5	,,	=	60
2	Mochis ...	,,	5	,,	=	120
1	Mistri ...	,,	10	,,	=	120
1	Salutri ...	,,	10	,,	=	120
1	Clerk ...	,,	10	,,	=	120
						20,292
	Add Staff-pay of Transport officer @ Rs. 50 per mensem				=	600
	Add cost of 78 extra reservists in lieu of sepoy-drivers				=	3,500

TOTAL COST OF ESTABLISHMENT, Rs. 24,392 per annum.

It will be observed that the regimental establishment includes a salutri, a nalband, a mistri, 2 mochis, and a clerk. These should all be enlisted as sepoys, and the rates of pay allotted to each in the above table would be staff allowances *in addition* to pay of rank. They could all add to their salaries by doing private work for the officers, who would probably find it convenient to pay a small monthly sum for their services.

The annual cost of three Commissariat mules and a driver being about Rs.480, 214 Government mules and their attendants would cost Rs.34,240. The regimental establishment as shown by the above details only comes to Rs.24,392, thus indicating a saving of Rs.4,898 in favour of the latter.

It is of course very desirable that the sepoy-drivers should belong to races forming part of the caste constitution of their regiments, but this would not be possible in all cases, and wherever an exception is unavoidable, it will be found advisable to enlist Jats, Gujars, Ahirs, or Muhammadans. The Lobána Sikhs, who were formerly the grain-carriers of the Punjáb, make excellent muleteers, and all Mussulmáns—whether Punjábis, Hindustánis, or men from Southern India—take more kindly to the care of animals than most Hindus. In the Madras Command efforts might perhaps be made to a enlist Brinjáris, a tribe of carriers which provided Wellington with transport in his campaigns in Mysore and the Dekhan.

The question now arises : Will recruits come forward for enlistment as drivers at the rate of pay here suggested ? From enquiries made among the men themselves, it would appear that a sufficient number of suitable men could be obtained without much difficulty. To give the scheme a fair chance, however, it would be necessary at first to obtain the jemadar and the non-commissioned officers of the Transport company, by transfers from the Cavalry. There are in every Silladar regiment many trustworthy duffadars and sowars who, though excellent soldiers, have lost the nerve required for manœuvring at speed. Such men would be invaluable in the regimental transport. Their knowledge of stable management, and the care of saddlery and gear, would greatly facilitate the establishment of a good system of interior economy, and their presence in an Infantry regiment would attract recruits of the class required, *i.e.*, men who have not quite sufficient money to provide the *assámi* demanded for Native Cavalry, or who have been rejected for that service, on account of their being under height. It is of course essential that a Transport-driver should be of robust physique for he is exposed to much fatigue on service, and has often to raise heavy loads; but whilst sturdiness is indispensable, anything over medium height is rather a disadvantage than otherwise.

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* Includes pay of rank as well as Transport-allowance.

The Transport establishment of Pioneer regiments would have to be slightly larger than that of battalion of the line, owing to their special equipment and tools for which carriage is always to be provided. The same may be said of the Sapper companies.

There would be some difficulty in organizing a Silladar transport in Madras, as the classes from which its regiments are recruited would seldom be able to produce the *assámi* required. In the absence of money from the men, Government would have to make a loan to each regiment for the purchase of its mules and equipment, and this would be gradually refunded by a monthly deduction of Rs.5 from each driver's pay. Working at this rate, each man's debt, *i.e.*, Rs.400, would be repaid in less than 7 years.

A regimental transport system organized on the line suggested would possess the following advantages:—

1. With British troops, greater efficiency and discipline owing to better supervision, each corps being held responsible for the condition of its transport. With Native troops a corresponding improvement arising from the employment of men of a superior class who, being the owners of their mules and equipment, would be personally interested in the care of the one and the preservation of the other.

2. Facility in mobilization, as the Commissariat would be relieved of the duty of providing corps with regimental transport at a time when its whole energies should be devoted to the question of supplies.

3. The Transport units of British and Native Infantry and Native Cavalry being complete in themselves would be available for use not only with their own or other regiments, but also with the general transport of the army.

4. The cost of regimental transport attached to British troops would remain much the same as at present, but that of the Native Army would be considerably reduced, as the expenses of Government would be limited to a monthly payment, the amount of which would be known to a pie. All expenses connected with the purchase of animals would be done away with, and the cost of administration would be reduced to a minimum.

CHAPTER II.

Supply of Officers and Subordinates.

"On occasions where large masses of public Transport-animals are collected for employment with troops in the field, officers must be especially appointed to the charge of the carriage of the army and held responsible for the condition and care of animals. It is not a mere compiler of accounts that is required for duties of this nature, but one who should be constantly on the alert, who should look after his charge in person, and by his own activity compel a corresponding attention to their duty on the part of his assistants."—SIR WILLIAM NOTT.

Officers.

SIR ARTHUR WELLESLEY, after his campaign in Mysore and the Dekhan, advised the Indian Government to "organize military transport, with trained animals and drivers, under active and intelligent heads." In the Peninsular, profiting by his Indian experiences, he gave his transport a distinctly military basis, and indeed was so much occupied with questions of carriage and supply "that he used humourously to say that he did not know that he was much of a General, but he prided himself on being a first-rate Commissariat Officer."

An army which like the British in Spain fought continuously in the same country for upwards of six years, gained an enormous advantage by the gradual training and discipline of its transport. The tendency of modern war, however, is to be short, sudden, and decisive. The age of lengthy campaigns is over, and no army can now enter the field, without incurring serious risks, unless it is provided with an organized and properly-officered transport. It is therefore of the highest importance that officers employed in this service should be specialists, thoroughly trained and thoroughly suited to their work.

The great loss of transport animals experienced in some of the Asiatic wars of the first half of the century, was attributable partly to climate but still more to want of supervision and organization. In the 1st Afghan War, some 20,000 camels died between Ferozepore and Kandahar, and in the Kabul Campaign of 1878—80 a repetition of the same mistakes led to a further loss of at least 60,000. In the first phase of the latter, the Indian Commissariat, though able to produce a sufficiency of animals and drivers, was utterly unable to provide for their organization or control and had eventually to supplement its own staff by the employment of officers from almost every corps in India, including the Volunteers and Police.

The experience of the Afghan War proved the necessity of forming a reserve of Transport officers and subordinates, and since then instruction in transport duties has become a recognized branch of our army training. During the last 10 years a succession of frontier expeditions and the conquest of Burma has given an immense amount of practical experience to many of our Transport officers, the benefit of which was clearly manifested in the recent campaign in Chitral, where, in spite of some hitches and delays, the transport service of some 35,000 pack-animals was administered with an absence of friction unknown in our previous wars. This result, however, was only attained by detailing some 80 officers for transport duties from corps in Northern India, often at a very great sacrifice of regimental efficiency. As in the Afghan War, the Commissariat officers were nearly all required for "supply," only 7 being available for purely transport work. Now if such strenuous measures are necessary to provide for the transport of a *division* of all arms, it is easy to imagine what the strain would be were we engaged in a serious campaign necessitating the employment of *two army corps*, operating simultaneously from separate bases such as Quetta and Peshawar. It is no exaggeration to say that without a large increase of officers a complete breakdown would be inevitable.

The number of officers in our British and Native regiments, more especially the latter, is barely sufficient in peace, and not one could be spared for the transport, without impairing their efficiency in war. Nothing but necessity in fact, can justify a system which provides for the wants of one service, by denuding the *cadres* of another. We do not supplement deficiencies in the Artillery by transfers from the Infantry or Cavalry, and there is no reason why regiments should be denuded of officers to provide for a department, which, differently organized, might generally have enough of its own.

Before suggesting a scheme for the officering of the Indian Transport, it may be well to enumerate the special qualifications to be looked for in officers of this service, and then consider how men are to be obtained of the stamp required.

The qualifications of a good Transport officer may be summed up as follows :—

1. He must have a practical knowledge of the care of animals, stable management, the art of fitting saddlery and gear, and the application of simple veterinary remedies. He must also be thoroughly instructed in the various methods employed for packing different descriptions of baggage and equipment, on various descriptions of animals.
2. He must have a good colloquial knowledge not only of Hindustáni, but also of Pushtu and Punjábi, the languages spoken by most of our transport attendants.
3. He must have practical experience in dealing with natives.
4. He must have tact, good temper, firmness, and judgment, combined with health, energy, and physical activity.

The importance of the first of these qualifications can hardly be realized by anyone not accustomed to the care of animals. The constant attention, regular grooming, and careful fitting of harness and saddlery which is essential to their health and efficiency, can only be assured by the constant supervision of officers who have been trained in the mounted branches.

The second qualification is almost equally necessary. No one could be more helpless than a young British officer in charge of a mob of Pushtu-speaking camel-drivers, with nothing but a Lower Standard smattering of Hindustáni as a means of communication between himself and his men ; and yet many of the Transport officers employed in recent expeditions have been junior subalterns whose knowledge of the language and customs of the men they commanded, was literally confined to what they had picked up from their servants.

The last two qualifications speak for themselves. If we wish to attract a good class of natives into the Transport, we must officer that service with men who know thoroughly how to deal with them. This kind of knowledge can only be gained by experience and cannot be acquired at a three months' course. We must in fact give up the present plan of complete dependence on our Cavalry and Infantry for Transport officers in war, and organize a special staff, with a suitable reserve, of sufficient strength to satisfy all ordinary requirements.

Many of our highest military authorities are in favour of separating the Transport from the Commissariat and placing it entirely under the Quarter-Master-General. Such a plan would have many advantages, especially in European warfare, but the general consensus of opinion in India is that supply and transport must be controlled by the same department. Our proposal, therefore, is that the transport duties should be handed over to a special corps which, though a branch of the department, would be employed solely on transport duties and would be sufficiently strong to supply the whole of the *personnel*, both of officers and subordinates, required for the "Train" of the army.

Until the newly appointed officers had sufficient experience and service to qualify them for administrative appointments, these, as now, would be filled by officers belonging to the Commissariat: the latter would, however, be gradually replaced as opportunity offered, until all had returned to their legitimate functions of "supply."

The officers of the proposed corps would be drawn from the following sources:—

1. By offering a certain number of Transport appointments for competition amongst candidates for Sandhurst, in the same way as commissions are now offered in the Royal Marines.
2. By the promotion of a number of selected non-commissioned officers from the ranks.
3. By the bestowal of commissions on a limited number of Indian Volunteers belonging to corps composed of planters and their assistants —a class thoroughly habituated to dealing with natives and accustomed to keeping horses.

We will now proceed to discuss each of these classes in detail.

The Competition Candidate.

Owing to the severity of the competition for appointments in the Indian Staff Corps, many candidates obtain a creditable position on the Sandhurst list, but fail to pass high enough to secure them an Indian appointment. Not being sufficiently well off to accept commissions in the line, they are compelled to resign their cadetships and abandon all hope of a military career. Young men so circumstanced would willingly accept appointments in the Indian Transport Corps, even at reduced rates of pay and pension; for though their prospects might not be as good as those of their comrades in the Cavalry and Infantry, they would at any rate be assured of a career in India, which both they and their parents would consider infinitely preferable to cattle-ranching in Taxes, orange-growing in Florida, or gold-hunting in Australia or the Cape.

Complete familiarity with stable management and the interior economy of a Mounted Corps being an essential part of their training, the Transport cadets would remain at Sandhurst for 12 instead of 18 months, and would undergo a special examination for commissions. The remaining six months would be spent at Aldershot, where they would be attached to the Army Service Corps, for instructions in drill, riding, driving, musketry, fitting saddlery and harness, shoeing, and all subjects relating to transport, including a course at the Army Veterinary School. After passing examinations in these subjects the cadets would be gazetted as 2nd-Lieutenants in the Indian Transport Corps, and would be sent out to India for duty.

On arrival the young officers would be posted as supernumeraries to Native Cavalry regiments stationed in the Punjáb, so as to give them an opportunity of learning Hindustáni and Pushtu, and familiarizing them with the system of a Native regiment, and the customs and the habits of the men. During the year they would spend in this manner they would be required to pass the Lower Standard examination in these languages, and at its conclusion they would have received a valuable preliminary training which would fit them for immediate employment in the Transport.

The Candidate from the ranks.

The increasing popularity of the army and the spread of education has done much to attract a superior class into the ranks. It is no exaggeration to say that there are numbers of non-commissioned officers, more specially in the Cavalry, who are perfectly qualified for commissions, but have little or no chance of obtaining them. It is very desirable that an outlet should be given for their advancement, and no way could this better be done than by granting them appointments in the Indian Transport. Non-commissioned officers selected for commissions should have 1st Class Certificates of Education and should have passed in Hindustáni by the Lower Standard. They should not be over 30 years of age, and they should, as a general rule, be unmarried.

Like the competition candidates, officers of the Transport Corps promoted from the ranks should be attached for a year to Native Cavalry, so as to accustom them to dealing with natives, and give them an opportunity of learning their languages. At the end of that period they would be posted to a Transport Corps for duty, but they should be detailed to attend Veterinary and Garrison Classes, as soon as they could conveniently be spared.

The Volunteer Candidate.

Any one who has been brought into contact with the planters of Kángra, Behár, Assam, and the Nilgherries, cannot fail to have noticed their fine horsemanship, handiness with gun and rifle, and capacity for controlling and directing large establishments of natives. Some of our smartest Volunteer Corps are recruited from this class, and though the prospect of a Lieutenant's commission would offer no attraction to seniors, many of the young assistants would gladly give up planting for soldiering, a profession for which many were originally intended. The award of a few regular commissions yearly, would make the Volunteer force more popular, and would also give the army some excellent officers; for the tact and administrative talents required for the management of a mob of coolies, would be equally valuable if applied to the administration of our Transport.

Officers so recruited would be attached for a year to Native Cavalry, and would be required to pass through a course of Garrison and Veterinary instruction before joining the Transport.

With a Transport organized on the lines suggested, there would be a considerable increase of officers, involving considerable expense. Their cost, however, could be materially reduced, by lowering the rates of pay. The struggle for existence in England is now so severe that there can be no doubt but what the Indian Government could obtain plenty of excellent Transport officers at the rates of pay noted below. The organization of a special Transport Corps would release a number of Commissariat officers for duties of supply,* and besides being cheap and efficient, would enable us to provide the *personnel* required for our Military Train, without disorganising the combatant branches of the army.

Promotion in the Indian Transport Corps would be regulated by the same rules as obtain for the Indian Staff Corps, *viz.*, the rank of Captain would be attained after 11 years' service, Major after 20, Lieutenant-Colonel after 26, and Colonel by subsequent selection.

The rates of pay and pension suggested might be as follows:—

Pay.

RANK.	Grade.	Rate of pay per mensem.	REMARKS.
		Rs.	
Lt.-Colonel ...	1st ...	1,000	There would be a Director of Transport for each Command, holding the rank of Colonel, and drawing Rs.1,400 a month.
Do. ...	2nd ...	800	
Major ...	1st ...	700	Commandants of Transport Circles would, in addition to pay of rank, draw Staff-pay at Rs.100 per mensem, and officers commanding Transport Corps a Command allowance of Rs.50 a month.
Do. ...	2nd ...	600	
Captain ...	1st ...	500	All officers on tour in the district would draw a travelling allowance of Rs.5 per diem.
Do. ...	2nd ...	400	
Lieutenant ...	1st ...	350	The 3rd Grade of Lieutenants would be composed of newly commissioned officers attached to Native Cavalry for instruction.
Do. ...	2nd ...	250	
Do. ...	3rd ...	200	

Until the officers of the Indian Transport Corps became qualified by rank and experience to hold important appointments, the Command of Circles and Corps might be given to selected officers of British and Native regiments as a reward for transport service in the field. They would be seconded in their corps while so employed, and would of course draw special allowances.

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* The Commissariat Department is, according to the January Army List, 39 short of strength.

Pension.—All pensions might very well be paid in rupees convertible at a fixed rate of exchange. The following rates are suggested :—

			Rs.	
After 15	years' commissioned service a gratuity of	...	15,000	
" 20	" " pension of	...	3,000	per annum.
" 25	" " "	...	4.800	
" 28	" " "	...	6,000	
" 32	" " "	...	7,200	

Besides the above there would be four special additional good service pensions of Rs. 1,000 per annum.

Under the system proposed, the training of regimental officers and non-commissioned officers at classes would be chiefly with a view to ensuring the maintenance of an ample staff of qualified superintendents for the care and command of the transport *belonging to corps.* They would nevertheless form a reserve for the general transport of the army, though it would be contrary to the principles of the scheme to employ them until the whole strength of the Transport Corps had been exhausted.

Subordinates.

The European subordinates of the Indian Transport Corps should be recruited, as now, from the ranks of the regular army. There should be a Sergeant-Major to each Transport Circle, and Staff Sergeants to each corps. This would necessitate an establishment of 60 Sergeant-Majors and 190 Staff-Sergeants. They would draw the same rates of pay and perform the same duties as at present. Candidates for appointment to the subordinate branch of the Indian Transport should be selected regimental non-commissioned officers who show special aptitude for this work at the Transport Training Classes. Like their officers, they should be required to pass an easy colloquial test in Punjábi and Pushtu before being confirmed in their appointments. The Veterinary Staff is far too small for the duties now required of it, and is in urgent need of expansion. It might be advisable to create a class of Veterinary Subordinates corresponding to the Assistant Surgeons of the Indian Medical Service. Like the latter, they would undergo a special examination before admission to the Veterinary School, and a suitable professional test on completing their three years' course. About 150 of these subordinates would be required, and they would be chiefly employed at the head-quarters of Transport Circles, not only for veterinary charge of the animals, but also to assist Transport Commandants in selecting and examining animals for registration and purchase. They would be also entrusted with the instruction of the Transport Classes in the veterinary portion of their course. As a military element would be very desirable among the Assistant Veterinary Surgeons, a certain number of appointments might be reserved for selected non-commissioned officers of Artillery and Cavalry, who would go through the prescribed course at a Veterinary School, in the same way as the other candidates.

The organization of Regimental Transport units would necessitate an establishment of about 250 salutris. These would be trained in special classes at the Veterinary Schools in the same way as Hospital Assistants are now trained for the Subordinate Medical Department. Native soldiers desirous of being instructed, would also be eligible for admission, and the salutris of the Native Infantry Transport should be mostly recruited in this manner.

Before concluding this chapter a word may be said on the subject of clerks. Transport officers on service cannot devote their whole energies to the care of their animals if they are perpetually worried by the irritating details of office work. This can always be avoided by the employment of well-trained clerks. They should all be enlisted and recruited from the same country as the men of the Circle to which they are attached. To provide the scale laid down on page 4 and a writer for each British Regimental Transport unit, we should want about 260 clerks, who might be formed into a "Corps of Transport Staff Clerks" arranged in grades with various scales of pay. The writers of Native Infantry units would be provided under regimental arrangements.

CHAPTER III.

Registration of animals, Reserve of drivers, Arrangements for Mobilization, Mule-breeding.

THE military powers of the continent, recognising the necessity for accurate statistics regarding their transport resources have instituted a census of horses, mules, and vehicles, so as to enable them to supplement the peace *cadres* of their Military Trains by employing the ordinary carriage of the country in war. In France a census of horses and carts is taken every third year. Animals and vehicles are classified by Committees which decide the amount of compensation to be allotted to owners, and the order in which their property would be requisitioned on mobilization. For neglecting to register his animals and carts an owner renders himself liable to a fine ranging from 25 to 1,000 francs.

A similar measure was arranged for in England in 1888, when the National Defence Act was passed through Parliament, the provisions of which empowered the Government in case of emergency to hire or purchase any animals or vehicles required. At the same time a system was established by which owners were invited to offer their horses for voluntary registration. Animals, which on inspection by an officer of the Remount Department are found suitable for army purposes, are registered, the owners signing an agreement and receiving an annual subsidy in return. The registered animals are inspected yearly, and the price at which they are to be purchased is arranged with the owner and recorded. By the terms of the agreement owners are bound to produce these animals at 48 hours' notice, and if they fail to fulfil their engagements are liable to a fine of £50 per horse.

No one is likely to dispute the truth of Wellington's dictum that "the Government has a right to call upon its subjects to furnish the means of moving those forces upon which the safety and tranquillity of the country depends," but this right should be enforced with moderation, and on a well-devised system acting equitably on every class. In spite of the liberal rates paid by the Commissariat for the hire of transport animals and attendants, the agricultural classes in India generally dislike such employment, and use every means to escape it. Although technically illegal, the impressment of carriage is always resorted to in practice, and, as our civil officers are well aware, the hiring of transport is always attended with a good deal of oppression and bribery. The *Tahsildar* and his subordinates hurry off the cultivator and his camels to do duty with the Commissariat, while the wealthy *Zamindar*, by some well-placed bribes, not unfrequently escapes. Pressure moreover, acts very unequally on different districts. Those near the base of operations are freely drained, while those more remote may scarcely be touched. As most of our campaigns take place on the North-West Frontier, the demand for transport in the Punjáb is much greater than it is elsewhere, and the pressure on its peasantry is thus apt to be unfair and burdensome. This is accentuated by the fact that, as nearly all our mules and camels are bred in that province, it is almost our only source of supply, for the bullocks of the North-West Provinces which furnished our transport in former days are now in less demand, being unsuitable for roadless and mountainous countries.

The remedy for these evils lies in the passing of an Act authorizing the impressment and compulsory registration of carriage, and the taking of a census of animals and carts, on much the same system as that in vogue on the Continent. The civil authorities are accustomed to collecting such statistics, and all that is required is that they should be at the disposal of Transport Commandants and compiled in a convenient form, available for immediate reference.

Every *Lumbardar* should be called upon to prepare rolls enumerating the number of horses, ponies, camels, mules, donkeys, bullocks, and carts in his village, and the names of the owners, and those lists should be verified periodically by the civil authorities. Failure to comply with this order, and evasions or omissions, should be punished by fines which would be recovered summarily, as in the case of arrears of revenue. The number of animals each district is able to spare without disorganizing its trade and agriculture, should be determined by the Deputy Commissioner, and each district *should be compelled by law* to provide that number, whenever required by the State. Registers should be prepared showing the exact distribution of the animals, and the owners, *who would be selected annually by ballot*, would be paid a small retaining fee, giving Government the right to either purchase or hire at rates previously determined, thus preventing the recurrence of a rise in prices such as took place on the mobilization of the Chitral Relief Force. We should in fact register our transport in the same manner as in England, except that in India registration would practically be an obligatory levy of animals by districts, whereas at home it is purely voluntary. By paying a fee of 10s. per horse, the military authorities of the United Kingdom are now able to lay their hands on some 14,000 transport animals; and by paying say Rs. 6 for each mule or camel, and Rs.4 for each bullock, a similar reserve could be organized without difficulty in India.

The peasantry of the Punjáb being alive to the profits to be earned by mule-breeding, require no coercion in the matter, and will be sufficiently encouraged if Government supplies them with an increased number of donkey stallions; but in other parts of India, notably the North-West Provinces and Madras, some sort of stimulus is required in order to induce the agricultural classes to embark upon this useful enterprise. Where the natural resources of the country do not include a sufficient number of mules and ponies suitable for army purposes, a light tax might be imposed upon the wealthier land-holders in order to compel them to devote their attention to stock-breeding; and at the periodical revision of the land settlement, *Zamindars* who had proved neglectful of this duty might be punished by the increase of their revenue assessments. Such drastic measures, however, would seldom be necessary, for with a Government establishment of 33,000 mules, and a system of subsidies for registered animals, there can be no fear of their becoming a drug on the market, and mule-breeding, far from being carried out at a loss, would be a source of considerable profit. Retired Native officers and pensioned sowars might be induced to take up the business by giving them a few cast mares from the ranks, placing Government stallions at their disposal, and undertaking to purchase the best of their foals at prices previously arranged. This would be specially facilitated by the establishment of Silladar Regimental Transport as described in Chapter I, for pensioners would be practically assured of a market for their mules, in the corps to which they formerly belonged.

The *inâmi* grants of land made to retired Native officers for distinguished service, might be bestowed conditionally on their maintaining a certain number of registered mules, and camels, and the excellent example set by the Maharâjas of Jaipur and Gwalior might well be followed by other Native princes who, unable to maintain Imperial Service Troops, might show their loyalty by keeping up small auxiliary transport trains, and organizing reserves of animals and men from which they could be rapidly expanded in war.

Colonies of Gúrkha pensioners are now springing up in the vicinity of most of our hill cantonments and it would be greatly to the advantage of Government, and to the benefit of the men, if they were encouraged to take up mule-breeding. The "line-boy" Gúrkha trained in this manner to the care of animals, would make an excellent muleteer, and a Transport Corps recruited from this source would be extremely efficient and give honorable employment to an increasing class which is now somewhat difficult to provide for. Free grants of land might be given to Gúrkha pensioners in Assam and the Kachin and Lushai hills, conditionally on their maintaining a certain number of registered mules; and the settlement of such colonies would have the additional advantage of being of service in preserving order among the local tribes.

The climate of Upper Burma seems peculiarly suitable for mule-breeding. The Pantháy mules of the Shan hills are not to be surpassed for hardiness and strength, and similar animals could be bred in other parts of the country with a little assistance from Government. The Burma battalions each maintain from 50 to 100 Mounted Infantry ponies; by increasing this establishment, setting aside a few brood mares, and providing some donkey stallions, mule-breeding could be carried on most favourably at the head-quarters of regiments, and in course of time each of these corps would be able to breed its own transport. To facilitate this object, regiments might be given grants of land on which the foals would be kept until old enough for work, and a stud established on the model of that belonging to the 11th Bengal Lancers at Probynabad.

Formation of a Reserve of Drivers.

It has been explained in Chapter I how each of the proposed Transport Corps would be expanded by the employment of registered animals and reservist-drivers into three complete corps in war. It has been shown how the camels, mules, and ponies required, would be provided by a sort of conscription among the registered animals of each district, of which the owners, *selected by ballot*, would be paid an annual subsidy. It now remains for us to describe how we would form a reserve of drivers. In every village community there are numbers of men, related to the *Zamindar* proprietors, who have mortgaged or forfeited their holdings and fallen from the estate of landholders to that of cultivators working for their wealthy brethren. In the Punjáb there are, besides the camel-owning classes of the frontier, various descriptions of menials such as *Chuhras*, *Dhanuks*, and *Kumbhars*, who are the hereditary carriers of the village. In the North-West Provinces, and in a lesser degree in Madras, similar functions are fulfilled by corresponding classes and to these must be added numerous subordinate agricultural castes such as *Ahirs*, *Kúrmis*, *Pásis*, *Lodhs*, *Gavériahs*, &c., all of which are more or less accustomed to the care of animals. Most of the classes enumerated are hereditary retainers of the village proprietors who pay them a scanty wage in kind, the amount varying with each harvest. Working through the village *Lumbardars*, the agency employed in registering animals could also be utilized in enrolling villagers of this description as drivers. Any number could be obtained by giving them reserve pay at Rs.2 per mensem, with a bounty of Rs.5 on enrolment. When mobilized or called up for training, they would be paid at the same rates as regular Transport attendants. An establishment of this kind would give us a large reserve of drivers always available for service. As the transport of each Circle would be mobilized periodically, animals and drivers would both be partially trained; moreover the business of mobilization would be extremely simple, for the reservists would naturally belong to the same villages as the registered animals, and both could be collected simultaneously.

For the sake of illustration let us suppose on the 1st March, 1896, the Commander of No. 6 Transport Circle (see map) is ordered to mobilize his 2 Mule and 2 Camel Corps. The Deputy Commissioners of the civil districts included in the Circle are requested by telegraph to issue instructions for the assembly of registered animals and reservist-drivers at Umballa by the 10th March. Their exact distribution is recorded in lists maintained by the District Superintendent of Police, so by the 3rd March each *Lumbardar* will have received an order calling up the details belonging to his village. On the 4th March the camels or mules, in charge of the reservists, and accompanied by their owners, will be starting for Umballa, where they would all be collected by the 10th. Men and animals would be equipped with clothing and saddlery as fast as they arrived at head-quarters; owners would be sent oft to their homes after having been paid the registered value or hire of their animals; and by the 12th March the mobilization would be finished, and the corps ready for service or any other duty required of them.

CHAPTER IV.

Employment of Transport in peace.

By the formation of Transport Circles distributed throughout the four Commands the necessity for hiring carriage in peace would be almost altogether removed. The transport of corps moving in relief would be provided by employing the Mule or Camel Corps of the nearest Transport Circle, which would be expanded to the extent required by calling up its reservists and registered animals. This, of course, would only be done in the case of corps unprovided with a regimental establishment, for regiments possessing their own transport would naturally move independently.

For example, a battalion moving from Agra to Lucknow requires carriage for 1,500 maunds of baggage. The Commandant of the Agra Transport Circle mobilizes his Camel Corps. This gives him 360 permanent and 680 registered camels for duty. He sends off 300 of his permanent establishment with the regiment, and keeps the reserves at Agra for two months' training at a Camp-of-Exercise. On the return of the permanent camels from Lucknow, reservists and registered animals would be dismissed to their homes. Movements in relief and district concentrations would thus give the transport ample occupation in winter; we have now to consider how we would employ the establishment in summer.

A good deal of transport is required for the collection and stacking of fodder on the Commissariat Grass Farms. Much work could also be done for the Irrigation Department, the Military and Public Works, Municipalities, Cantonment Committees, and other large employers of carriage. The most suitable employment, however, would probably be found in connection with the postal service to places at a distance from the railway. Thus a Mule Corps stationed at Piparia on the G. I. P. Railway could run tongas and carts between that place and Pachmarhi. Similar employment might be found for detachments between Kushalgarh and Kohat, Hasan Abdul and Abbottabad, Hoti Mardan and the Malakand, and other places similarly situated. Men thus employed should be given Rs. 2 a month working pay, to be provided for from postal revenues. No detachment should be kept on command for more than six months at a time, as apart from the wear and tear of animals, such employment would cause a great relaxation of smartness and discipline.

Work for bullock detachments could be found at the principal arsenals and ordnance manufactories such as Dum-Dum, Cossipore, Allahabad, Ferozepore, &c. At great seaports such as Calcutta, Madras, Bombay, and Karachi, numbers of carts are required to remove cargo from ships and docks to the merchants' warehouses. At present this is done entirely by private carriers, who, on several occasions, have shown a tendency to strike for higher wages. The mercantile community would probably be glad to avail themselves of an organized and disciplined cart-service, and Transport units so employed would doubtless earn handsome profits. Such an application of military carriage to commercial purposes would perhaps be a startling innovation, but it is at any rate worth a trial.

Railways are now under construction in almost every part of India. Wherever such works are going on, transport is required for the conveyance of machinery, stores, building plant, and the supplies required for the workmen employed. Instead of hiring civilian carriage for this purpose, it might be possible to employ units of the Indian Transport.

The above are a few suggestions regarding the peace employment of the *general* transport; the utilization of *regimental* carriage presents fewer difficulties. In the first place by employing mounted Transport-drivers as messengers at all staff offices, correspondence would be easily and quickly delivered without calling upon regiments for orderlies. Nights in bed would be increased, duties would be lighter, and more men would be available for parades.

Packages arrive daily at cantonment railway stations for officers and corps of the garrison. These, at present, are collected under regimental and individual arrangements, but with transport available a regular parcels delivery service might be organized, and goods delivered at their destinations by Transport-carts provided by corps in succession. Carts could also be employed in conveying mails and parcels between the station and the local Post Office, in removing stable litter, in carrying the bedding of station guards, and in bringing rations for men and horses from the Commissariat to the regimental lines. The animals could also be used in drawing water from wells for the irrigation of public gardens, and might even be hired out to officers, for use in their traps and tongas.

Wherever regimental transport is available, it should be made use of in the tactical instruction of the troops. At present field manœuvres necessarily take place within a 10 miles radius of cantonments, as any work beyond that distance would entail the hiring of carriage. With regimental transport available it could be used for flying columns moving through the district on service conditions, and squadrons and companies instead of doing their annual training in the vicinity of barracks, could be sent into camp some distance away. Practical instruction could also be given in the attack and defence of convoys, the formation of *laagers*, *zaribas*, &c., and other operations, which have now to be treated theoretically.

CHAPTER V.

Interior economy, Training, Matériel, Light Railways, Traction Engines.

THE proposal that Transport-drivers should be armed, has been frequently discussed, and much may be said both for and against it. On the whole it would appear that while it is obviously absurd to provide men with arms when they do not know how to use them, it is very desirable that the drilled drivers of our *permanent* transport should be given the means of defending themselves and their convoys. A carbine slung on the back with a bandolier carrying 12 cartridges would be amply sufficient for this purpose without imposing much weight or restraint. Thus armed, drivers would be able to furnish their own stable-picquets, and guard their animals whilst grazing.

Transport-drivers should be clothed in khaki as at present, but with Bedford Cord breeches in the place of knicker-bockers, as they would be required to ride when on orderly duty. Every man should have a clasp-knife attached to a lanyard, and every animal should have a *kurpa* or grass-cutter's hoe, attached to its saddle. Carts should be of the light pattern now in use, which has been found to be thoroughly serviceable by practical experience in Chitral. Those belonging to the Jaipur and Gwalior cart-trains never broke down during the whole expedition. Each cart should be provided with a stout waterproof paulin, made rather long, for use as a shelter for the drivers by pegging down its corners like the outer fly of a tent (see fig. I). A pick or shovel should be strapped to each cart, and each section of transport should be provided with a lantern, as loads have often to be shifted in the dark. All mules and ponies should be broken in to harness as well as to pack, and the equipment of each Transport unit, whether departmental or regimental, should include a few plain riding saddles and bridles, for use by mounted non-commissioned officers or men detailed for orderly duty.

The drill of the driver, whether belonging to a regiment or to the Transport Corps, should be confined to instruction in riding, driving, stable duties, and to the packing and loading of kits, tents, and stores. To this might be added "repository drill," *i. e.*, the replacing of broken wheels and poles, also the taking to pieces, putting together again, and packing of Transport-carts, for conveyance by rail or sea. Each man would be put through a special course of musketry, but drill in the strict sense of the term, both on foot and mounted, would be limited to simple and necessary movements, such as could be taught in two or three months. Although elaborate manœuvres are not required, it is necessary that our Transport units should be sufficiently drilled to be able to park their animals and carts in a prompt and orderly manner; and that they should be trained to take up simple formations suitable for protecting a convoy.

Where the country permits it, the best formation for a mixed convoy of carts and pack-animals, is to march in three columns, carts on the road, with pack-animals on either side. Every endeavour should be made to reduce the length of the column by marching on the broadest possible front (see fig. II). For this reason pack-animals should be trained to travel in droves, without being led by their drivers. In Persia, where mules are extensively used, a pony provided with bell acts as a leader, and the mules follow him of their own accord.

Marching convoys are now seldom required in Europe, for the main lines of communication are along rivers and rail-roads; in savage warfare, however, their employment will still often be necessary, and our Transport units should therefore be trained in parking and preparing for defence. In a sudden attack, the simplest and quickest formation is to form a double line of carriages or pack-saddles, facing inwards, with the animals collected between them (see fig. III). In open country such as the Soudan and South Africa it is usual to make use of the transport in the preparation of defensive works such as *zaribas* and *laagers;* as these formations might also be useful in Afghánistán, Persia, and East Africa, their construction should be regularly practised in peace.

It will have been noticed that in the Transport Scheme suggested, the regimental units are solely composed of mules and ponies. The camel is no doubt an excellent baggage-animal and is invaluable on the line of communication, where his usefulness might be increased by employing him for draught; but he is not suitable for employment with troops making rapid marches, being slow, delicate, and awkward to load. Besides being a bad marcher over rough ground, the camel is difficult to move by rail: moreover while single-humped lowland camels soon break down in a cold and mountainous country, the two-humped Bactrian of the hills, who is a good climber, suffers greatly from the heat of the plains. The camel-carts used extensively in Rájpútána and Bundelkhund should also prove useful for military purposes. The single camel-cart will carry 21 maunds, and as its pace is exactly the same as that of a pack-camel carrying only 5 maunds, the advantage of employing these vehicles is obvious. (See fig. IV.)

It is of course useless to advocate the employment of wheeled transport in mountainous and roadless countries such as are frequently traversed by punitive columns on our North-West and North-East Frontiers. There the only alternative to the pack-animal is the coolie,* the most troublesome form of transport in the world; but in operations on a larger scale such as the Afghán War and the recent expedition to Chitral, there are always some portions of the theatre of operations, more especially on the lines of communication, which are perfectly suited not only to wheel-transport but also to light field railroads and tramways. (See fig. V.)

The extension of the Indian railway system now enables us to mobilize our army and form our base depôts within a few miles of the frontier, and places us in an immensely better position than we were on the outbreak of the Afghán War, when all our stores had to be carried by carts and pack-animals from the railhead at Jhelum to Peshâwar. Once the base is left, however, we are in much the same position as before, and our transport from there to the advanced depôts is still composed almost entirely of pack-animals. In the Chitrál Campaign, wheeled carriage was used between Nowshera and the Málakand, but although the ground was flat and presented no serious obstacles to the engineer, no attempt was made to relieve the trains of carts and camels either by a light field railway, or a tram-line worked by animals or coolies. Here it is that our transport is most capable of improvement.

It seems extraordinary that an essentially industrial country like Great Britain, which is better able to supply her army with railway plant and mechanics than any other nation in the world, and which, moreover, was the first to make use of railways in war,† should be without a single railway battalion, or any military railway organization beyond a few companies at home, and short lengths of line at Chatham and in the Woolwich Arsenal. At the present time railway troops form a recognized portion of every continental army. In 1880 the Russians under Skobeloff laid a light Decauville tramway from the Caspian to Akhál Tepé, a distance of 135 miles, with eminently satisfactory results, and before the end of the campaign, the tramway was converted into a permanent railroad. Other instances might be quoted of the use of military railroads such as in Abyssinia in 1867, at Suákim and on the Nile in 1885, and the portable tramway 2 miles long, from Barkal to above the rapids on the Karnafuli, in the Chin-Lushai Expedition of 1889-90.

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* The carrying power of coolies, however, might sometimes be increased by giving them wheel-barrows or light hand-carts.

† In the Crimea.

The Barkal tramway, which may be considered fairly typical of lines of this kind, was of 24" gauge, and consisted of Bessemer steel rails weighing 21lbs. to the yard, laid on steel sleepers. The trucks had platforms of 5'×4', with wheels of 12" diameter. The average load carried by a truck was 20 maunds, eight coolies being told off for the haulage of each. The tramway carried from 800 to 1,000 maunds of stores per diem, thus performing the same work as 50 bullock-carts or 800 coolies.

For local purposes such as forming camps, field works, distributing stores, and even at a push for the general transport, we cannot do better than imitate the wheel-barrow and plank of the civil contractor, and make use of a single rail tramway as shown in fig. VI. It can be worked by mules, bullocks, or donkeys, and is an extremely cheap auxiliary to the ordinary cart-transport. This system requires some sort of track for its use, although it may be of the roughest description.

The best type of light field railway is perhaps the Decauville portable line (see fig. VII), which was used with such success by Skobeloff. It has a gauge of only 16" and is constructed entirely of steel, in portable ladder-like sections, solidly attached to the sleepers, which only require to be laid and joined together. As each section of rail only weighs 112lbs., a single platelayer could place a section in position without difficulty. The cost of such a line, six miles long, with two locomotives and thirty trucks, is £7,200, which includes every requisite for construction, including tools.

Besides field railroads and tramways, traction engines might often be found extremely useful on the lines of communication for bringing up heavy stores such as bridging equipment, siege trains, and building materials for forts and permanent camps. Hitherto the great objection to these engines has been that they were useless in hilly country, but the Swiss Government has recently adopted a pattern which made a successful ascent over a stony road with a gradient of 1 in 6.

The type of engine required (see fig. VIII) is one which is light so as to be able to cross field bridges. The "Steam Sapper" used in the Berkshire manœuvres weighed, with fuel, water, and the driver, a little over 5 tons. It was worked by a non-commissioned officer and 5 men; its average speed was five miles an hour on a hilly road; it hauled ten tons 40 miles a day; and it only cost about £400. By changing the wheels, a road locomotive of this description can be turned into a Steam Roller; and used as a stationary engine, it can pump water, drive the dynamos of an electric search light, and haul a ferry-boat backwards and forwards across a river.

A great objection to the use of field railways and road locomotives for Asiatic warfare is that it would sometimes be difficult to obtain the fuel and water they require. This would be true enough under certain circumstances, but as they would be used chiefly on the rear sections of the lines of communication they would be able to draw their fuel from the base, which would be generally some point on the permanent lines, such as Pesháwar or Quetta. Water can generally be got by boring, but if necessary a few tank trucks (see fig. IX) might be added to the rolling-stock, so as to form movable watering stations where required.

For the working and construction of these lines it would be necessary to raise two companies of Railway Sappers, one of which would belong to Bengal and would be stationed with its plant at Pesháwar, and the other to Bombay with its *matériel* stored at Quetta.

It may be urged that the construction of field railways would make war very expensive. If we analyse the transport charges of many of the expeditions which have taken place since the Afghán War, we should find that great savings could have been effected had we made use of a light line which, at the conclusion of the war, might have been taken up and returned into store, ready for use in the next campaign. Some may say that the possible utility of such a railway in war would not justify its maintenance in peace; to this we reply that apart from its value at Camps-of-Exercise, it would often be most useful for the conveyance of food into famine-stricken districts away from the main lines of communication.

CHAPTER VI.

Financial Aspect of proposals.

"La critique est facile; l'art est difficile."—MUFFLING.

THIS apposite quotation is peculiarly applicable to the subject of this chapter which is far too technical to admit of useful discussion by any but financial experts. In studying the advantages and disadvantages of a scheme, the soldier only looks to efficiency. The financier on the other hand is influenced by wider considerations and the stern necessity for "cutting his coat according to his cloth." The proposals here set forth would perhaps be costly, but it must be remembered that their incidence would be spread over a period of years. Moreover the frontier roads and defence works which have caused such heavy outlay during the past few years, are now nearly completed, and some of the funds which their construction has absorbed will become available for transport purposes. If the question of expense is still an insuperable obstacle, we must effect such economies as are possible by disbanding some of our least useful regiments, and making a corresponding increase in the Active Reserve of the Native Army. Mobility is the first essential of efficiency, and it is far better that we should have a smaller army ready to go anywhere at a moment's notice, than to keep up troops unable to leave their cantonments except after lengthy and costly preparations. In any case let this system have a trial by applying it experimentally to a portion of the army, and then, if successful, extend it to the four Commands.

The limited space at our disposal prevents us from calculating the outlay which the adoption of these proposals would involve, but it could easily be ascertained from the *data* given, and we therefore conclude this essay with a *précis* of probable items of expenditure, and a detail of possible economies.

Items of expenditure.

(I) Pay and allowances of 250 officers of the Indian Transport Corps.

(II) Pay and allowances of 250 warrant and non-commissioned officers belonging to the same.

(III) Pay and allowances of 150 veterinary subordinates, 200 salutris, and the Corps of Clerks.

(IV) Pay of Native officers, non-commissioned officers and men of the permanent Transport establishment.

(V) Pay and bounties of 14,400 reservist-drivers at their homes.

(VI) Pay of 4,800 reservist-drivers when called up for training.

(VII) Cost of registering 34,560 mules and camels, and 8,640 bullocks, and keeping up the permanent establishment.

(VIII) Travelling allowances of Transport officers when on registration duty.

(IX) Pay and allowances of officers and men of two companies of Railway Sappers.

(X) Cost of maintaining—

5	British Cavalry Transport units.
11	Horse and Field-Artillery Transport units.
16	Mountain Battery Transport units.
02	British Infantry Transport units.

Also the Silladar Transport of—

40	Regiments of Native Cavalry.
46	Centres of Native Infantry.
7	Battalions of Pioneers.
16	Companies of Sappers.

(XI) Non-effective charges, such as pensions, office establishments, compensation for dearness of food and forage, &c.

Possible economies.

(I) In time of war a large number of transport-animals instead of being hurriedly purchased or hired at enhanced prices, would be immediately available at moderate rates previously determined.

(II) The cost of the transport in peace would be reduced by hiring it out to the Postal Department, Military and Public Works, Railway and Dock Companies, Municipalities, Cantonment Committees and private individuals.

(III) Saving in cost of administration through employment of officers at reduced rates of pay.

(IV) Difference between cost of Silladar and Government Regimental Transport in the Native Army, amounting to Rs. 120 for each section of 3 mules and a driver, *e. g.*—

One driver and 3 mules now cost Government about	Rs.	480 p. a.
One sepoy or sowar-driver and 3 mules would cost	„	360
Difference ..	„	120

The sudden abandonment of one system of administration in favour of another is nearly always productive of confusion and inefficiency, we should therefore carry out our reforms by degrees, keeping as our motto "*festina lente.*"

THE IMPROVEMENT OF THE PRESENT ORGANIZATION OF TRANSPORT IN INDIA.

By Captain F. J. Moberly, D.S.O., 37th Dogras.

Motto:—"*Durch schaden wird man klug.*"

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i.—Supply of officers and men trained in Transport duties.

ii.—Supply of attendants.

iii.—The most economical employment of Transport in peace-time.

iv.—Registration of Transport in peace-time.

v.—Arrangements for collecting Transport by hiring and purchase, on mobilization.

vi.—Financial aspect of the proposals.

What we require in India is a large amount of transport, with an efficient supervising staff for the same, of officers, subordinates, and attendants, which, during peace-time, while maintaining its efficiency, shall cost little to the State, and also be at hand, and available, at any time, on the outbreak of war. It is acknowledged that our presen system falls short of these requirements. The following scheme shews one way by which a sufficient supply would always be at hand, at but little extra cost to the State.

i.—*Supply of officers and men trained in Transport duties.*

Our present system is open to the following objections:—

(*a*) Under existing arrangements it would be extremely difficult to obtain a sufficient number of trained officers, and subordinates, on the mobilization of one or more army corps.

(*b*) The Commissariat Department would be strained to its utmost to find officers, and subordinates, for purely Commissariat duties, and would be able to find very few, if any, for Transport work.

(*c*) The present course for the Transport instruction of regimental officers and men is too short in duration.

(*d*) It is not practical enough.

(*e*) It is looked upon as what is commonly termed a "loaf."

(*f*) Actual experience on service has shown that regimental officers and men detailed for Transport work are very ignorant of the language and customs of the native attendants, and this has proved a great difficulty.

(*g*) Officers and men are very liable to, and do very rapidly forget what they have learnt during their course.

My proposals to overcome, or obviate these objections are shortly as follows:—

(*a*) Every British and some Native Infantry regiments to each supply one trained British officer for Transport work, on the outbreak of war, who, during peace-time, would be borne on the rolls of their regiments, and not seconded.

(*b*) Similarly to the above, every British, and some Native Infantry regiments would each supply fifteen trained subordinates for the same work.
(*c*) A certain number of officers of the Commissariat-Transport Department to be always employed solely on Transport work.
(*d*) The course of Transport instruction for regimental officers and men to be longer in duration.
(*e*) The course to be more practical.
(*f*) The work to be done during the Transport course to be more clearly laid down.
(*g*) Officers detailed to teach Transport classes to have more power over officers and others undergoing instruction.
(*h*) Classes to be periodically inspected by the G. O. C.
(*i*) During the course, those undergoing instruction to have more to do with native attendants.
(*j*) *Vivâ voce* examination in Hindustáni to be compulsory.
(*k*) Officers and men, once trained, to undergo yearly repetition courses.

I will now take these objections, and proposals, in order, as they stand above, and will shortly discuss the former, and give details of the latter.

(*a*) *Under existing arrangements, it would be extremely difficult to obtain a sufficient number of trained officers, and subordinates, on the mobilization of one or more army corps.*

To begin with it is doubtful whether we have a sufficient number of officers, trained in Transport duties, for all the work that there would be for them to do, including the charge of regimental transport. Even if there were a sufficient number, all officers commanding regiments ordered to the front, would very naturally object to their officers being taken from their regiments, at the very time that they would be most required. This would be more especially the case with Native Infantry regiments, which are already, in the opinion of a good many people, greatly under-officered, all the more so in these days of magazine rifles, and smokeless powder, when we are told that officers are more likely than ever to be "picked off."

(*b*) *The Commissariat Department would be strained to its utmost to find officers and subordinates, for purely Commissariat duties, and would be able to find very few, if any, for Transport work.*

One has only to consider the difficulty with which officers of the Commissariat-Transport Department obtain leave, (the reason being that they cannot be spared,) to see how under-officered the department must be even in peace-time. A small expedition like the Chitral Relief one, showed how really short of officers they were. I think, however, that it is hardly necessary to discuss the question further and the remedy is obvious.

(*c*) *The present course for the Transport instruction of regimental officers and men is too short in duration.*

This course, as now laid down by regulations, lasts six weeks. When one considers the many and varied duties to be mastered, and the fact that the large majority of those undergoing the course have little or no former knowledge of, or acquaintance with, such matters, it is evident that only a smattering of them can be attained in this time. This is, I think, more especially the case with non-commissioned officers and men. No doubt there were reasons for shortening the course, but I think that, having been put to the test and having been found too short, it ought to be lengthened again. Commissariat officers can seldom devote their whole time to teaching the classes, and consequently the most cannot be made of the time. Officers commanding regiments no doubt objected to losing their officers' services for several months at a time, but I do not think that this should be allowed to count, considering the vital importance of an efficient Transport service.

(*d*) *The course of instruction is not practical enough.*

Transport work, it is generally allowed, can only be thoroughly learnt and mastered on the line of march and in camp; yet the course of instruction is entirely carried out in the Commissariat office and the Transport lines. It is only by being in charge of animals on the march, seeing them working as they would do on service, with all sorts and conditions of loads to carry, when one never dreams of loading mules by the absurd drill they teach one in these classes, that one really begins to understand what Transport work is like. The thousand and one questions that crop up on service and on the line of march, which make one think for oneself, one never hears of in the Transport lines. The fitting of saddles is, especially, one of those things which cannot be learnt properly in the Transport lines, and it is one of the most important lessons to be learnt.

(*e*) *The course of instruction is looked upon as what is commonly termed a "loaf."*

That the course is thus, often—and in fact generally—termed, is a fact, and this no doubt caused, to a great extent, the dislike that Commanding Officers had to sending their officers through these courses, when they lasted for a reasonable time. There are several reasons for this—the main one, I think, being that, on account of Commissariat officers who were detailed to teach these classes having practically no spare time to look after them, in several cases the classes were handed over bodily to a warrant, or non-commissioned officer of the department to teach. This, of course, was an error, though it could hardly be called the fault of the officers concerned, as they had no other course open to them. These warrant and non-commissioned officers doubtless, in very many cases, allowed officers under instruction to do what they liked, and said nothing if they were absent morning after morning. Another reason was very likely due to the fact that the Commissariat officer in charge of the classes had no power over those attending, and if an officer chose to loaf and waste his time, and failed in his examination, perhaps, at the end, no one cared or said much about it; and probably if the Commissariat officer had declined to keep the officer on, as soon as he saw that he did not mean to work, he himself would have been "dropped on." There is, further, no doubt that, in the general run, the actual time spent in the Transport lines, and the Commissariat office, is but short, and compares very unfavourably with courses of instruction in other subjects.

(*f*) *Actual experience on service has shown that regimental officers and men detailed for Transport work are very ignorant of the language and customs of the native attendants, and this has proved a great difficulty.*

The reasons for this are obvious. The only times that officers and men, during a Transport course, see the followers at all, are at morning stables, *perhaps* twice a week at evening stables, and when they are paid their wages (this generally only once during a 6 weeks' course). During stables the necessity for speaking more than a few words to them seldom arises, and then generally the same words are used over and over again. Anything in the nature of a conversation is rare in the extreme. It is true that officers and men may have passed in Hindustáni, but the Hindustáni that they speak to their Munshis and that they write in their exercises, is a very different language to that spoken by the genius "drábi." Of their customs and the best way to treat native followers, they must, perforce. remain absolutely ignorant, unless they happen to be in a Native regiment; but, as a rule, Transport officers are from British corps.

(*g*) *Officers and men are very liable to, and do forget what they have learnt during their course very rapidly.*

A man, after undergoing his Transport course, returns to his regiment, and unless the regiment has its half transport in charge, or unless, by a streak of fortune, he goes on service in charge of transport, he is almost certain to forget what he has learnt, in an extremely short time. It *may* come back to him—true—but that is hardly satisfactory.

Proposals in detail.

(*a*) *Every British and some Native Infantry regiments to each supply one trained British officer, for Transport work, on the outbreak of war, who, during peace-time, would be borne on the rolls of their regiments, and not seconded.*

Orders should be issued informing all British Infantry regiments in India that, on mobilization, they will each be liable to be called upon to supply a British officer for general Transport duty. This officer to be exclusive of their own regimental Transport officer. Officers commanding regiments would, of course, be responsible, that they had always two trained officers in the regiment, one for general Transport duty, and one for regimental. In order to minimize the chance of objections on the score of paucity of officers, it would be desirable to count the officer detailed for general Transport work in each regiment among the number of officers who are allowed to be seconded, at any one time, from that regiment. Taking the number of British Infantry regiments in India as 50, and the number of Transport-animals that each officer could supervise properly with 15 non-commissioned officers and men (see next para.) as assistants as 1,000, we should thus obtain a sufficient number of officers to look after 50,000 animals, exclusive of all regimental transport. These officers would, of course, be seconded on mobilization, and their places could be filled from the home battalion, or from Sandhurst, that is to say, if it was considered necessary to do so.

A certain number of Native Infantry regiments would also be able to supply an officer each. Allowing for those ordered to the front, for those in reserve, for battalions who might have to supply their link battalions with British officers, and for battalions otherwise denuded of officers, and taking the number of Native Infantry regiments in India as, roughly speaking, 125, I think that we should be able to count on 30 Native Infantry regiments being able to supply us with an officer each. These officers could be utilized, with 15 non-commissioned officers and sepoys (see next para.) as assistants to each of them, to supervise, or take charge of 30,000 more animals, if such a large number as 80,000 Transport-animals, exclusive of regimental transport, were required. But probably they would be more profitably employed in collecting hired transport, or purchasing it. They would be more useful for this work than their comrades from British regiments, as they would, knowing the language better, be better able than them to cope and treat with native dealers. As the Native regiments, who supplied these officers, would be those who were least likely to get ordered to the front, they would be under no necessity of having two trained officers always in the regiment, as would be the case with British regiments, as they would, of course, have no necessity for regimental Transport officers in cantonments. There would probably be no great difficulty in informing the particular Native regiments who would thus have to supply officers, as, according to the present mobilization scheme, it is pretty well known which regiments would be the last to be ordered on service. As officers, thus detailed, would have to forego all chance of accompanying their regiments on service for any large campaign, it would be necessary to compensate them in some manner. I think that if this compensation took the form of one month's privilege leave every year, and also a permanent monthly horse allowance during peace-time, it would suffice, and that officers would deem it worth their while to take these appointments. On service, I would pay them on the same scale as Transport officers are paid at present. It would be further advisable that their services, during the campaign, should be fully recognised in despatches, and if it was understood that good Transport work on service would be suitably rewarded, it would, I am certain, have more effect in making officers keen to obtain these appointments, than any amount of compensation or remuneration in peace-time; and as Transport work is one of the hardest, as well as one of the most thankless jobs on service, it would not be unreasonable to expect this.

(*b*) *Similarly to the above, every British, and some Native Infantry regiments would each supply* 15 *trained subordinates for the same work.*

In addition to the British officers, which, as I have shown above, 50 British and 30 Native Infantry regiments would each be called upon to supply, I would also ask them to give 5 non-commissioned officers and 10 privates (or sepoys) each to act as assistants to their own officers, and to serve under them in the same Transport-section of 1,000 animals. This may seem a large number, but for real efficiency could hardly be reduced much. Officers commanding regiments should be asked to be very careful in picking non-commissioned officers and men for these appointments; only men of good character should be selected, and men should be taught to consider it as a reward for good conduct that they should be thus selected. It should be a *sine qua non* for all candidates for permanent employment in the Commissariat-Transport Department, that they should have filled one of these appointments in their regiments. As officers commanding regiments would, very naturally, complain at losing the services of 5 non-commissioned officers at once, permission might be given them to appoint 5 more in their places as soon as mobilization was ordered. These non-commissioned officers and men should be remunerated during peace-time by a yearly bonus, similar to that which regimental signallers receive. In time of war, I would pay them so much extra a month on something like the following scale.

Non-commissioned officers, British ...	... Rs.	10 a month.
Ditto Native ...	... „	5 „
Privates, British	... „	7 „
Sepoys, Native	... „	3 „

This, however, is a matter that would have to be considered, as although one does not wish to pay them too much, yet it would not do to appear mean, more especially as the work, on service, would be sufficiently severe.

(c) *A certain number of officers of the Commissariat-Transport Department to be always employed solely on Transport work.*

As this may appear as if I was venturing on the often-debated question of separating the Commissariat and Transport Departments, I will say at once that no such idea enters into my proposals. What I wish to urge is that Transport is such important work that officers cannot, as a rule, do both their Commissariat and Transport work, and, as a rule, it is, I think, the Transport work that has to go to the wall. Therefore I think that it is absolutely necessary that officers should be detailed *solely* for Transport duties; I do not wish to lay down a hard and fast rule that certain officers shall be always doing Transport work, because I think that it is an excellent plan that officers in the Department should have a knowledge of, and be able to perform, both Commissariat and Transport duties. To begin with, there should be an Assistant Commissary General for Transport with each of the Head-Quarters of the Punjáb, Bengal, Madras, and Bombay Commands. Then there should be a Transport officer at each of the following stations:—Rawalpindi, Quetta, Meerut, Peshâwar, Mian-Mir, Lucknow, Agra, Calcutta, Bangalore, Secunderabad, Rangoon, Mandalay, Poona, Karachi and Mhow. At the two first of these, two Transport officers would probably be necessary at each. It might also be found necessary to post Transport officers at other stations, and it might be found possible to do without them in one or two of the above stations. These officers would have entire control of all the Transport in the district, the equipment, the purchasing of animals for transport, and the charge of all Transport attendants; the instruction of Transport classes would be carried out by them; they would have to carry out the registration of all Transport that could be hired, or bought, on the outbreak of war, in their districts, and they would have to really know the resources of their districts in this respect. They would thus have as much work, I fancy, as they could efficiently perform, and during the cold weather, when their work would be hardest, they would, as I propose to show later on, have regimental officers, non-commissioned officers, and men, who were undergoing repetition courses, as assistants. To finish with there should be an Inspector-General of Transport in India, who would be a senior officer, *not* of the Commissariat-Transport Department, who would act directly under the orders of the Commander-in-Chief, and would report directly to him on the state of the Transport in general, and would also make all his recommendations to him. All this would, no doubt, cause the addition of several officers to the present establishment of the Commissariat-Transport Department, but I think that the efficiency thereby gained would more than compensate for the extra cost entailed.

(d) The course of Transport instruction for regimental officers and men to be longer in duration.

The course should last for at any rate four months. In nothing less than this time can the full details of Transport duties be mastered. Transport officers will be detailed, as I have shewn in the last para., to instruct classes, and consequently the most will be made of the time, and the result should be good.

(e) The course to be more practical.

Of these 4 months, the first 2 months should be spent learning the rudiments and theory of the work in the Transport office and lines. The next 2 months should be spent with transport on the march. With reference to this last proposal, I would point out that the Malakand Brigade has to be fed from Nowshera, and that there are every year some 15,000 animals working in the Bandipur-Gilgit road, for about 4 months, carrying the rations for the Gilgit garrison. That officers could be attached to the Transport working on both roads with great advantage to themselves and, at any rate some, to the Transport concerned, is obvious, and the whole two months' practical part of their course of instruction might be thus spent. The non-commissioned officers and men of their own regiments would naturally accompany them. The cost of this would be, comparatively speaking, small, as beyond the cost of their journey there and back, the only other expense would be either the granting of horse allowance to officers, or allowing them the use of a Transport-pony. The latter, probably, would be cheapest and most satisfactory.

(f) The work to be done during the Transport course to be more clearly laid down.

It may be said that the work to be done is very clearly laid down; this may be so, but it is a fact that no two Transport classes do the same work in the same time. Naturally, with officers in charge of classes, who have more time to devote to their tuition, matters would improve considerably; but it is, I think, very desirable to have a clearly-recognised syllabus of work. It would also be an advantage if marks were given for work done during the course, which marks would count in the final examination.

(g) Officers detailed to teach classes to have more power over officers and others undergoing instruction.

It would have a great effect if Transport officers, in charge of classes, were given the power of sending officers and men, undergoing instruction, back to their regiments, if they did not work properly, reporting fully at the same time their reasons for doing so.

(*h*) *Classes to be periodically inspected by the G. O. C.*

The General Officer commanding the district, or a senior officer deputed by him for the work, should invariably inspect all Transport classes towards the end of their course. Regular inspection reports would be drawn up, and the capacity of individuals noted; and it should be clearly recognised that these reports would have a great deal to do with the subsequent employment of officers in Transport work for expeditions and field service, as well as of non-commissioned officers and men as Transport assistants.

(*i*) *During the course those undergoing instruction to have more to do with native attendants.*

Officers should be given entire charge of, at any rate, one troop, with their own non-commissioned officers and men to assist them. They should be entirely responsible for their (the attendants) discipline, and interior economy during this time, and should be empowered to give punishments for minor offences subject to the confirmation of the Transport officer. They should be required to know the name of each man in their troop, his caste, where he came from, and any other details of importance about him, such as whether he was smart, knew his work, &c. They should know the terms of enlistment, scales of pay and pension, arrangements for clothing, &c., of every class of attendant. Marks should also be given for their knowledge of this work, to count in the final examination.

(*j*) *Vivâ voce examination in Hindustáni to be compulsory.*

Ability to give distinct and intelligible orders to Transport attendants, and also to understand the conversation of these men, should be insisted on. Sentences might be read out by the examiner which the candidate would have to translate to an attendant, and the attendant might be told to prefer a petition of some sort to the candidate. Officers and men should never be excused from this examination, even though they had passed the H. S. Hindustáni. It would give candidates a better chance if they were allowed to pass this examination after they had gone through the two months' practical part of their course.

(*k*) *Officers and men, once trained, to undergo yearly repetition courses.*

This should consist of one month's work every year, either in the Transport lines and office of the district, when they would act as assistants to the Transport officer, and would be able, let us hope, to help him somewhat in his work, or it should be spent in charge of Transport on the line of march. Officers and men accompanying expeditions in charge of Transport, or with their regiments on the line of march, would naturally not need to undergo this repetition course for that year. The yearly bonus to non-commissioned officers and men, should be dependent on the reports they received at these courses.

ii.—*Supply of attendants.*

The following are some of the objections to the present system:—

(*a*)—The pay and scale of pensions are small; the clothing supplied is inferior, and too little of it, and there are no proper arrangements for fitting and repairing this; the scale of rations is less than that of a sepoy; the hutting and tentage allowance is too little; the leave-rules are unfair.

(*b*)—In consequence of the above, the class of men who come as attendants is inferior and they are looked down upon.

(*c*)—They are unarmed.

(*d*)—There is no really good rank or pay that they can attain to, and consequently they have but little to look forward to.

(*e*)—Transport agents have too much power over the men, and as they are frequently being changed about, the service-books and descriptive rolls are often not properly kept up.

(*f*)—There would be great difficulty experienced in getting any large number of attendants if a sudden demand for them, such as would happen on mobilization, arose.

My proposals to overcome, or obviate, these objections, are shortly as follow :—

(*a*)—To grant a better scale of pay and pensions; to supply a distinctive uniform, similar to that of sepoys, and to appoint a tailor to each Transport-section; to grant the same compensation for dearness of provisions during peace-time, and the same rations on service as are granted to sepoys; to give better hutting and tentage allowance; to improve the leave-rules.

(*b*)—To raise the status of the whole corps and to be more careful in enlistment.

(*c*)—To arm them with swords; to teach them the use of these, and to give them a little drill.

(*d*)—To appoint some well-paid Native officers in each Transport-section.

(*e*)—To place the men directly under Transport officers, in the same way as a regiment is under its British Colonel; not to allow Transport agents to have anything more to do with the attendants than a regimental clerk has to do with sepoys; to keep Transport agents always attached, until they are promoted, to the same Transport-sections, so that service-books and descriptive rolls may be kept up properly.

(*f*)—To form a reserve of attendants on the same lines as the Native Army Reserve.

I will now take these objections and proposals in detail :—

(*a*) *The pay and scale of pensions are small; the clothing supplied is inferior, and too little of it, and there are no proper arrangements for fitting and repairing it; the scale of rations is less than that of a sepoy; that hutting and tentage allowance is too little; the leave-rules are unfair.*

A mule-driver receives Rs. 7 a month, and unless he is lucky enough to get promoted to duffadar, and then to jemadar, he continues to draw the same pay, even although he remains in the service for 30 years, at the end of which time he *may* receive a compassionate allowance of Rs. 4 a month. If, however, he serves for 20 years, and then finding that he is getting too old for the hard work and the knocking about, [and one must remember that, as a rule, a native ages more rapidly than a European,] he retires, he is entitled to 6 months' pay as gratuity : under the circumstances, I think that it is truly wonderful that we can obtain anybody to do the work. As regards clothing he is much worse off; for instance, a khaki blouse is supposed to last him two years, and this has to be kept in repair by himself. Again, he is supposed to require less food to do his work efficiently on than a sepoy, and yet in nine cases out of ten he has the harder work of the two, more especially on field service. It is universally admitted that the hutting allowance is absurdly inadequate, and either local funds are started, or only the most primitive hutting can be provided; and how the number of men, that are supposed to get into a general service tent, can really manage to do so, I do not know. Drivers are only granted leave on their providing an efficient substitute, which is really most unfair, as, besides losing pay the whole time he is on leave, he probably has to pay his substitute something extra.

(*b*) *In consequence of the above, the class of men who come as attendants is inferior and they are looked down upon.*

The men who, at present, form the majority of our Transport attendants are, as a rule, the sweepings of our large cities, and although they have done most excellent work on almost every occasion on which they have been called upon—a fact, which, under the circumstances, redounds greatly to their credit—yet they are not altogether satisfactory. On all sides they are looked down upon, more especially by good class natives and sepoys, and this in itself is enough to damn the whole corps. So much is this the case, that every one feels that he has a right, on service, if anything goes wrong with the Transport, to cuff or kick the wretched "drábi" with impunity, —a most reprehensible custom, and one which ought to be most strictly repressed. It is the cause of more trouble and desertions than anything else, and is naturally quite enough to disgust any man with his work.

(*c*) *They are unarmed.*

A Transport-driver has nearly as often as, and in some of our frontier expeditions oftener than sepoys to run the risk of getting shot, or cut up (take, for instance, the Chitral Relief Force operations). Moreover he labours under the disadvantage of having three mules to look after, and, having no weapon, is unable to protect himself. I have never heard one really good reason against arming these men, and it is most unfair on them, to put them into positions of danger, with almost a certainty of their being killed, if they are attacked. That they might put their weapons to a bad use, is no more true of them, I think, than of any other armed man.

(*d*) *There is no really good rank, or pay that they can attain to, and consequently they have but little to look forward to.*

It is this, I am convinced, more than anything else, that keeps a better class of native from enlisting as attendants. The utmost that a man can hope to become is a jemadar on Rs. 12 a month, and if he "is in the draught mule establishment, he has in his charge animals, carts and equipment to the value of Rs. 40,000 and he is held responsible for the general efficiency of this valuable establishment." —*Wickham.*

(*e*) *Transport agents have too much power over the men, and as they are frequently being changed about, the service-books and descriptive rolls are often not properly kept up.*

That Transport agents have too much power is a fact; how they have obtained it is, perhaps, not easy to say; but one reason is that too much is left in their hands by British officers; that an attendant can often obtain promotion, which he would not otherwise obtain, by "greasing the palm" of the Transport agent is well known. How often one comes across men's service-books that have not been properly kept up, and how seldem one comes across descriptive rolls that are kept up at all, any Transport officer can tell us. This, of course, has often been the cause of loss to the men concerned, and it is, I think, mainly due to the Transport agents not being kept, for any length of time, with the same lot of Transport, or to the Transport itself going on service, and on its return being sent to another station, with, in the meantime, two or three changes of Transport agents.

(*f*) *There would be great difficulty experienced in getting any large number of attendants if a sudden demand for them, such as would happen on mobilization, arose.*

That this is the case, has been proved over and over again. Even were it possible to obtain the numbers, the majority of them would be quite untrained, and consequently very useless until they had learnt their work, and would only add more to the confusion that seems inseparable from collecting a lot of Tansport together. The men who would be obtained, would also, most likely, consist of all the loafers from the bazaar, who, on finding that the work was harder, and the "pickings" less, than they imagined, would take the first opportunity to desert with what articles of Government property, sufficiently portable and valuable, they could manage to annex.

Proposals in detail.

(*a*) *To grant a better scale of pay and pensions; to supply a distinctive uniform, similar to that of sepoys, and to appoint a tailor to each Transport-section; to grant the same compensation for dearness of provisions during peace-time, and the same rations on service as are granted to sepoys; to give better hutting and tentage allowance; to improve the leave-rules.*

I would leave the present pay of duffadars and drivers as it stands. The pay of jamadars, &c., I will discuss later on. I would, however, give duffadars and drivers good-conduct pay at the rate of 8 annas a month after 3 years' service, Re. 1 a month after 5 years' service, and 8 annas a month extra for every 3 years' service after 5 years. Rules for granting and depriving men of their G.-C. pay would have to be carefully drawn up, and I think that men should only be deprived of it for *serious offences*. I would also institute a better scale of pensions; a man might be given a small pension, say Rs. 3 a month, after 21 years' service and Rs. 5 a month after 30 years' service. As regards uniform, I would give them a khaki uniform coat and pyjamas, a paggri with a distinctive coloured fringe, putties, shoes, and sword-belt,—a free issue to be given on joining, and a yearly half-mounting allowance afterwards. A tailor (*dirzi*) should be appointed to each Transport-section, to fit and repair this uniform. I would also give them other additions in the way of clothing. I would, however, not like to lay down exactly what should be given, and what not, without more data than I have at hand. Exactly the same compensation for dearness of food, during peace-time, and the same ration, on service, should be given to the Transport attendant as is given to the sepoy. I would also give them the same, or very nearly the same, hutting and tentage allowance as is granted to the Native Army. It would do no more than suffice for reasonable wants, and would keep the men in better health. As regards leave, I would grant two months' leave every year on full pay, to 15 per cent. of the attendants between the 1st April and the 1st October, or even between the 1st May and the 1st September; and *urgent* leave should be granted at any time not exceeding one month, provided that the man's services could be spared.

(*b*) *To raise the status of the whole corps and be more careful in enlistment.*

By raising the pay, and treating the men more liberally they would feel that their position was so much improved, and that they had become more like a real part of the army, that they themselves would think more of their position, and this, in itself, would make others think better of them. We should be certain to get a larger number of recruits to choose from, and would be able to raise the standard for enlistment considerably, in consequence. My main proposal is, however, to divide all Transport attendants into sections, and a man once enlisted in a certain section, would permanently remain in that section, unless *absolute necessity* arose for transferring him. These sections should be numbered like regiments, and should be, in every way, treated like separate regiments (*i.e.*, for promotions &c., &c.). Take, for instance, a section of mule-drivers. No.——Section, Transport Corps (mule-drivers) might be its denomination. It would consist of the full number of attendants for 1,000 pack-mules. It would be divided into 5 troops with attendants in each for 200 pack-mules. On service the chief command of each Transport-section would be placed under a British Transport officer, with his 5 non-commissioned officers and 10 privates as assistants. There would be a subadar-major, who would be *the* responsible executive subordinate, 5 subadars (one in command of each troop), 10 jemadars, 40 duffadars and 365 drivers, besides salutris, mochis, blacksmiths, &c., much according to the present scale per 1,000 aminals.

The Transport officer would have approximately, the same powers over his particular section as a Colonel of a Native regiment has over his regiment. His direct superior would be the departmental (Commissariat-Transport) officer, under whose orders he was for the time being, who, again, would be directly under the G. O. C. In this way one would create *esprit de corps*, which should prove of great benefit; and I am convinced that, under these conditions, we should be able to raise a corps of Transport attendants, who would prove themselves as much an efficient part of our British Army, as our Native regiments have done. I have not the space here to go into further details, and will merely say that regulations for these sections should be laid down, as much as possible, on the lines of the regulations of the Native Army; as it cannot but be a mistake to make too much difference between the two, considering the vital importance that an efficient corps of Transport attendants has for us.

(*c*) *To arm them with swords, to teach them the use of these, and to give them a little drill.*

I would arm them with swords of native pattern, either the tulwar or the Afghan straight knife, and would teach them how to use these. I would not, however, waste too much time in this tuition, but would encourage the men, by small yearly prizes for competitions, to occupy their spare time in mastering the use of their weapons. The reason that I say I would arm them with a tulwar, or a "*chåreh*" is that these are both good "cutting" weapons, and although a "pointing" sword is no doubt, in our eyes, superior as a weapon of offence, it is hardly understood to be so by a native, and would take him longer to learn the use of, and even then he would very likely feel less confidence in it than one of his own native weapons. Now, as regards drill: I can hear a great outcry against drilling these men, but I think that it could not possibly do any harm, would take up very little time—as only the rudiments of foot-drill would have to be learnt—and would so benefit the men by setting them up, and giving them a better idea of discipline, that it would be quite worth while to attempt it.

(*d*) *Appoint some well-paid Native officers in each Transport-section.*

As I have shown in proposal (*b*), I would have 1 subadar-major, 5 subadars, and 10 jemadars, in each section. The subadar-major, who should invariably be specially selected, I would pay Rs.40 a month. Subadars would receive Rs.25, and jemadars Rs.15 a month. I do not think that this can be considered excessive, more especially when one considers the value of animals and equipment that are in their charge. This would not entail so much extra cost, as might appear at first sight, as at present there are 20 jemadars on Rs.12 a month each per 1,000 animals, and my proposal reduces this number to ten, at a slightly higher rate of pay. However the cost is to be dealt with later on.

(*e*) *To place the men directly under the Transport officers in the same way as a regiment is directly under its British Colonel; not to allow Transport-agents to have anything more to do with the attendants than a regimental clerk has to do with sepoys; to keep Transport agents always attached, until they are promoted, to the same Transport-sections, so that service-books and descriptive rolls may be kept up properly.*

During peace-time, each section would be under the orders of the Transport officer of the Commissariat-Transport Department of the district in which they were stationed. Regimental Transport would, of course, be only indirectly under him, but they would be under the Transport officer of the regiment they were attached to, who would report to him. The Transport agent would be merely his clerk, and would have as little as possible to do with the men; orders should not be issued through him, and he should never be allowed to usurp authority. On service each section would be under its special British Transport officer, who, during peace-time, should be allowed an opportunity of making the acquaintance of the men. *Promotions should always be made by British officers themselves*, and for this purpose a *confidential* roll of all men in each section, with their characters and technical knowledge, should be carefully kept up by the British officers in charge of sections, and should be passed on by them personally to the officer who relieves them. Transport agents should be attached to one section, and, except when promoted or for some other really unavoidable reason, should not be separated from their section ; it will thus be to their interest to see that service-books, descriptive rolls, &c., are all properly kept up, and will understand that they have to work for their own particular section and that such work will influence their future promotion.

(a) *To form a reserve of attendants on the same lines as the Native Army Reserve.*

For this purpose sections should be linked together in groups of two or three, according to the districts they are stationed in. Each section should have a reserve of 100 men, enlisted for general service and liable to transfer to any sections of the same class of attendants. One would thus have the nucleus of a large number of new sections, to be formed on mobilization, to give attendants to the extra transport that would have to be purchased or hired at such a time. The arms and clothing for these men would be kept at the Transport Head-Quarters of the district. Service in the Reserve should be restricted to men of good character, who were discharged, after completing from 3 to 12 years' service from any cause other then misconduct.

Gratuities and pay might be granted on the same lines as those granted to the Native Army Reserve. They should be called up for two months' training every two years, and during that time would draw full pay and any good-conduct pay they drew when discharged from the Active list. Other details would require some thinking out, and for this I have not sufficient space at my disposal. The question of officering these reservists is one that it might be difficult to decide at first. Whether such ranks should be allowed among the reservists, or whether subadars, jemadars, and duftadars, would be better supplied from the Active list, or perhaps from retired sepoys who have Transport certificates, is a matter that I am unable to discuss fully here.

To finish—I will now put down the total number of attendants that, I think, should be with every 1,000 pack-mules, and which would form one Transport-section.

1 Subadar-Major.
5 Subadars.
10 Jemadars.
40 Duffadars.
365 Drivers.
5 Buglers or Trumpeters.
1 Dirzi.
5 Salutris.
2 Shoeing-smiths.
10 Saddlers.
1 Carpenter.
3 Blacksmiths (2 shoeing-smiths could do black-smiths' work.)
3 Hammer-men.
3 Bellows-men.
1 Transport Agent.
2 Peons.
2 Weighmen.

This is very nearly the same as the present establishment. I have reduced the numbers of some artificers, and added others, but the cost of this total establishment will be little more than the present cost.

iii.—*The most economical employment of Transport in peace-time.*

It is, I believe, maintained by the Commissariat, and other military authorities, that the present establishment of Transport is kept almost fully employed, during peace-time, on various duties, such as work in cantonments of a military description; ordinary relief of guards and outposts; frequent small frontier expeditions; water-duty in the hills; and Camps-of-Exercise.

There are, however, no doubt some stations where the Transport is very little used, and in others, a less amount of Transport could probably do the necessary ordinary work, and that these should be utilised by other departments, or even hired out to individuals, or on contract, is very desirable, reducing as it does the very heavy expenditure of the Transport establishment. Further, the Chitral Expedition has shewn us that we do not possess sufficient Transport for at all a large force, ready to our hands, and if some way could be found of permanently employing them during peace-time, we should be thus enabled to increase our establishment to what would be a desirable and efficient amount, and which would make the mobilization of two army corps a simpler matter than it would be at the present moment. I propose to shew that it is possible to thus permanently employ Transport, and I will, for this purpose, divide my proposals into the following headings :—

(*a*) Transport hired to private individuals.
(*b*) Ditto ditto or lent to public departments.
(*c*) Ditto ditto out for contracts.

(*a*) TRANSPORT HIRED TO PRIVATE INDIVIDUALS.

Sub-dividing this into different kinds of Transport we have :—

(i) Ponies for draught or saddle-work.
(ii) Mules ditto ditto.
(iii) Bullocks ditto ditto.
(iv) Camels for pack-saddle.
(v) Elephants.

(i) *Ponies for draught or saddle-work.*

If the ponies were young and strong, it would, I feel sure, be very easy to get officers to keep them, during peace-time, as hacks, or for dog-carts. To District Officers, Engineers, and others, who have a lot of riding about the country to do, it would, I feel certain, prove a great boon. They would be saved the trouble and expense of purchasing animals for themselves, and when transferred to another district, they would not have either to sell them off, at perhaps a loss, or to go to the expense of taking them with them. They would simply return them to the Transport authorities of the district, and on arrival at their destination, they would get others from the Transport authorities of that district. European and other subordinates in the Military, Public Works, the Commissariat, Telegraph, and other departments, besides warrant and non-commissioned officers of regiments, would, doubtless, also be glad to avail themselves of these.

Now, as regards the arrangements which it would be necessary to make for the scale of hire, the replacing of casualties, and the question of attendants. As regards the first two of these, hirers might be given the option of—(I) paying Rs. 5 per month, hire, and being relieved of all responsibility for casualties, excepting such as were caused by carelessness, overwork, bad feeding, or anything that might be termed the fault of the hirer; or (II) paying a yearly bonus of Rs. 10, and being held responsible, for replacing the pony, or for paying its registered value, if it died or became unsound, or incapable of further work, during the time that it was in the hirer's possession.

As regards the question of attendants, hirers might be given the option of—(I) taking regular Transport attendants to look after the hired pony, or ponies, and providing their pay (exclusive of half mounting and other allowances) and good-conduct pay (provided that this did not exceed Re. 1 per mensem) or, (II) paying Rs. 2 a month, extra, for each animal hired, and being allowed to hire their own attendants. This of course, only, if attendants were available, and hirers did not wish to make use of their services. (Thus, for every 3 ponies hired, without attendants, Rs. 6 a month would be paid, nearly amounting to a driver's pay.)

It might be laid down that, if 3 ponies or more were hired by any one person, their attendants must also be taken with them, at the rate of one attendant for every 3 ponies. If more attendants were required by hirers, than were available on the Active list, men in the Reserve might be given a chance of such employment if they desired it, or even more attendants might be enlisted.

(ii) *Mules for draught or saddle work.*

These might be hired by individuals on the same terms as ponies would be hired, but would probably not be so largely, or anything like so largely, required as ponies.

(iii) *Bullock for draught or saddle work.*

These would find few hirers among individuals, and might be hired out on the same lines as, but perhaps on more favourable terms than, ponies.

(iv) *Camels for pack-saddle work.*

The only persons likely to hire these would be District Officers, Engineers, and others, who had a lot of travelling to do in parts of the country where there were no railways. Similarly to mules and bullocks, the hiring would be arranged on the same lines as I have proposed for ponies.

(v) *Elephants.*

These form only a small portion of our Transport establishment and the demand for them would be probably only for sporting purposes, and at a certain time of year; the terms of hire would probably have to be specially arranged as also the responsibility for replacing casualties.

(*b*) TRANSPORT HIRED OR LENT TO PUBLIC DEPARTMENTS.

The question of hiring or lending in these cases would have to be carefully considered; but on account of the palpably great advantage to Government of having their Transport kept for them, practically free of expense, during peace-time, it would probably be more politic to lend than to hire, as likely to cause less objections from the departments concerned.

Taking then for granted that the transport would be lent and not hired, we have to consider what class of transport would be most in requisition. Mules would, of course, be preferred to ponies; bullocks and camels would be useful for some kinds of work; and elephants would practically only be employed by the Forest Department.

The following departments would probably be able to utilise mules, bullocks and camels: The Military and Public Works, the Telegraph, Postal, and Irrigation Departments; and Municipalities would have work for bullock-carts.

The Military and Public Works Departments have at all times some building or other work of similar nature going on, and must, of course, contract themselves for the carriage of materials, &c., or the contractor, who is doing the work, must do so. It would be apparently easy enough to arrange that, in such cases, these Departments should either use Government Transport themselves, or arrange that the contractors did so. One great objection no doubt to this is that, on the outbreak of war, all these works might, and very likely would, be brought to a sudden stop by the transport being taken away. When one comes to think of it, however, this would very probably be so in any case. As besides the fact of officers in the Military Works Department being nearly all of them required at the front, and the probability of a large number of officers in the Public Works Department being also so required, Government, in its haste to acquire as much transport as possible, would almost certainly lay hands on all animals fit for work, irrespective of what contracts they might be carrying out at the time. After all the question to decide is whether the great saving in cost during peace-time does not more than compensate for the possible, but improbable, chance of some important work being brought suddenly to a stop on the very seldom occurring outbreak of war. And I think that there is little doubt that the answer must be in the affirmative.

The Telegraph, Irrigation, and Postal Departments have all of them need of transport, at times, if not always, and they should be told to invariably use Government Transport when available.

If this employment of Government Transport caused an actual loss to the department concerned, then enquiry might be made to see whether the advantages gained compensated or not for this loss, but no other excuse should be accepted unless an extremely good reason could be brought forward in its defence.

At first it might be a little hard to lay down hard and fast rules to govern this lending of transport, and probably experience only would shew what the best arrangement would be; but I propose to put down a few general remarks about it, which would, I think, be desirable to settle at first.

Thus, although the departments concerned would, of course, pay for the feeding of animals, and, to a certain extent, the pay of the attendants, it would hardly, under the circumstances, be fair or even politic, to ask them to replace equipment when worn out, although they might, or might not be required to keep it in repair. Then, the pay of the officers, such as subadar majors and subadars, of artificers, salutris, and Transport agents, as well as the hutting, half mounting, and other allowances could hardly all be debited to the departments using the transport. It would, of course, be necessary that the department borrowing the transport should have control over its movements, but it might not be advisable to allow them to interfere in the interior discipline and economy of the sections or troops, and periodical inspections by Transport officers would, probably, have to be held.

(*c*) TRANSPORT HIRED OUT FOR CONTRACTS.

Some of the objections against this are: Government entering the public market as a competitor in the carrying trade; the difficulty of thus obtaining permanent employment for transport; the trouble involved; and the possible loss through defalcation of contractors.

It would, however, be quite worth while to try this, *if* there was available transport which could not be employed under heads (*a*) and (*b*). The best way would be to advertise, or let it be known through civil officers, that a certain amount of transport could be hired on contract with the stipulation that, on the outbreak of war, the transport should be at once returned to Government, and compensation would be made by them for any loss ensuing from this. Naturally, very careful regulations would have to be drawn out, but, were this done, I see no reason why it should not answer.

iv.—*Registration of Transport in peace-time.*

The scheme I propose I will enter into under the following headings:—

(*a*) Division of country, where transport is available, into districts.
(*b*) Supervision of districts.
(*c*) Rules under which registration would be carried out.
(*d*) Arrangements for purchase or hire on mobilization.
(*e*) Attendants for hired transport, and arrangements for equipment to be supplied with hired transport.
(*f*) Periodical inspections.

(*a*) *Divisions of country, where Transport is available, into districts.*

These districts should coincide, as far as possible, with the military districts, but it may be found necessary to sub-divide some of them, as they would otherwise be too large for one officer to supervise. With reference to this, it might also be advisable to enquire from the civil authorities their opinions as to the formation of these districts, *i.e.*, as regards their size and boundaries; as it might, in some cases, make a good deal of difference to large owners of transport animals, and might influence them accordingly whether they had to bring these animals a long way to be registered and inspected, or not.

(*b*) *Supervision of districts.*

A registering officer should be appointed for each district, who should, as often as possible, be the Transport officer of the district. Notices should be sent round, through the civil officers, to all owners of transport inviting them to offer their animals for registration, and informing them of the dates that the registering officer would visit certain centres. It is most indispensable to the plan, that civil officers should give all the assistance in their power to the registering officer. He should have a salutri, and a Transport agent, to assist him in the work of registering and it might be found advisable to keep these two permanently moving about the district, giving veterinary advice free and finding out the real resources of the country as far as transport was concerned, and keeping themselves acquainted with the whereabouts of the registered animals.

(*c*) *Rules under which registration would be carried out.*

Animals brought for registration would be inspected and, if found suitable for transport work, would be registered and branded. In registering them the following points should be noted: Registration and brand number; description of animal; for what description of work it is fitted; the name and dwelling-place of owner; the arrangement come to with the owner as to whether it is to be hired or purchased on mobilization; if to be hired, the rate of hire and whether attendants and equipment are to be hired with it, and if so on what scale, &c.; if to be purchased, the amount to be paid for it; the place where it is to be periodically inspected; the time of inspection; and any other remarks affecting the case.

The owner should then sign the agreement and receive in return an annual subsidy of Rs. 10 per animal.

The animals should be branded on the neck with the district initial letter and their registration number.

If the animal is to be purchased, the amount to be paid for it should be settled at each inspection, as the amount would necessarily fluctuate with the condition of the animal. The place where it is to be inspected might be changed at the wish of the owner, as long as he gave due notice beforehand; it might also be possible to consult the owner's wishes as to the time of inspection.

The terms of the agreement that the owner should sign, would be somewhat as follows:—

That he is bound, on mobilization, and after seven days' notice, to produce those animals, which were "passed" at the last inspection, and for which he has received a bonus, sound, and in fit condition for immediate work, at a certain place. That if he fail to do so, he makes himself liable to be fined, the amount of fine not to exceed Rs. 200 for each animal not produced in a fit state. This agreement to be terminable by either party after 3 months' notice. The subsidy of Rs. 10 to be paid in two sums of Rs. 5 for each animal at each half-yearly inspection.

(*d*) *Arrangements for purchase or hire on mobilization.*

A distinct understanding should be come to with the owner, who should, however, act quite voluntarily in the matter, as to whether the animal is to be purchased or hired on mobilization taking place. If purchased, the amount should be agreed upon, the owner again acting voluntarily, at each half-yearly inspection; if at any inspection, the owner were dissatisfied with the price offered, he could decline to accept it, and either give the 3 months' notice of withdrawal, or arrange to hire out the animal instead of selling him. If the animal is to be hired, it would be necessary to have a most clear and simple agreement laying down exactly the rates and conditions of hire.

(e) *Attendants for hired Transport and arrangements for equipment to be supplied with hired transport.*

If it was agreed with the owner, that he should also supply attendants for his hired transport, and this seems to be the best plan, it should also be arranged with him how many attendants he would supply for the number of animals; what rate of pay they were to draw; whether any of them would be given temporary higher rank as overseer or duffadars, and what pay these also would draw; whether clothing would be issued to them, and how much; what scale of ration they should draw; what compensation would be given for wounds, or death; and in fact every question that would be at all likely to arise at any time, should be fully discussed beforehand. The same should be done as regards equipment supplied with hired transport, and it seems a good plan that animals should have the equipment that they are used to.

(f) *Periodical inspections.*

These should be held half-yearly at well-defined centres; owners might be consulted as to the times that would suit them best to have these inspections held, and the wishes of the majority should generally fix the date or dates. Registering officers, with their salutri assistants, would carefully inspect every animal, comparing it with their descriptive roll, and would alter the purchasing price, or not, or give the 3 months' notice of discharge to the owner, according to the animal's condition. Owners should, at the same time, be asked if they clearly understand the regulations, and if they wish any alterations to be made in the terms of hiring, &c. By giving due notice to the registering officer of the district in which his animals were registered; and, before presenting them for inspection in another district, an owner should be permitted to bring up his animals for inspection at any centre of any district that suits him, as long as he says where he is going to produce them, so as to enable the registering officer of the original district to send a descriptive roll of the animals in question to the registering officer of the other district. Such concessions may give some extra trouble, but would, I think, induce owners, who would otherwise not do so, to register their animals.

In carrying out this registration scheme, it should be recollected that natives are most conservative, and suspicious of new schemes; that the Commissariat-Transport Department have not got a very good name among private owners of Transport, and that, consequently, we cannot expect to do great things at first, until the whole idea has been fully grasped by those concerned.

Civil officers would be able to give great assistance, and local Governments should be especially spoken to about it; and if the matter is only carried out with tact, and not "rushed," it should, I think, prove a decided success.

V.—*Arrangements for collecting Transport by hiring and purchase on mobilization.*

With the above scheme of registration of transport in peace-time, it ought to be comparatively simple to have good arrangements cut and dried which might be on the following lines—for collecting it on mobilization.

Registering officers would, on mobilization, issue the seven days' notice to all owners of registered transport in their district, and either they themselves, or purchasing officers specially appointed, (the former would, of course, be the better of the two,) would at once repair to the centre of the district where the animals were to be produced. As it would be known, long beforehand, how many animals they would purchase, and how many they would hire, they would know also how many attendants, and how much equipment, as also how many British officers and subordinates would be required. The attendants would be sent from the Reserve, or else enlisted and sent to the same centre, and British officers and subordinates would also repair there, and would all assist in collecting together their own sections, and, when ready, would proceed with them to the front. The equipment would be stored all ready, either at the same centre, or at the Transport head-quarters of the district, and would only require to be fitted. The railway companies would have been long before informed how many trains and trucks would be wanted, and how many days after mobilization each lot would be required. To make this arrangement as easy as possible, the registering officer would order in those Transport-animals first which were nearest to the centre, and, by calculating how many animals he would be able to purchase each day, should be able to tell each owner almost the exact date, on which his animals would be required. The best way would, probably, be to order in the animals in the following order:—

(i) Animals to form a complete section or sections on being purchased.

(ii) Animals to form a complete section or sections on being hired.

(iii) Animals remaining to be purchased, which are not sufficient in number, to form a complete section.

(iv) Animals remaining to be purchased, which are not sufficient in number to form a complete section.

If, however, attendants were to be supplied with all the hired transport, and any difficulty was found in obtaining the full amount of attendants for the transport which was to be purchased, it might be advisable to substitute (ii) for (i).

It is at this juncture in the proceedings, that the salutri and Transport agent permanently remaining in the district [see para. (*b*) of iv, "Registration of Transport in peace-time"] would be of the most use. They would be able to say exactly where all of the animals were, which of them were in the best condition, and how far the numbers calculated on would be likely to coincide with the numbers actually procured. With British Transport officers, each accompanied by the 15 subordinates from his own regiment, and each working hard to get his Transport-section off to the front, the collecting ought to be fairly rapidly carried out. To teach officers what their work on these occasions would be like, the half-yearly inspections, every now and then, might be carried out on the lines of a mobilization, at almost no extra cost to the State.

Further details cannot, I am a afraid, be given here, on account of want of sufficient data, and also of space; but I hope that I have shown fairly clearly the arrangements for collecting this transport.

vi.—*Financial aspect of the proposals.*

This is the aspect that I like least of all, and I find that it is quite impossible for me, owing to not having sufficient data at my disposal, to do more than show what would be the chief heads of fresh expenditure, and where a fresh saving might be hoped for, and this, of course, only during peace-time.

Officers and Subordinates.—

i.—Travelling expenses of extra officers and subordinates to, and back from, Transport courses.
ii.—Permanent monthly horse allowance to 80 regimental officers, and yearly bonus to 1,200 regimental subordinates, trained in Transport duties.
iii.—Pay and allowances of extra officers appointed to the Commissariat-Transport Department to carry out purely Transport duties.
iv.—Pay of Inspector-General of Transport in India.
v.—Travelling expenses for, and cost of mounting, regimental officers undergoing practical part of Transport course.
vi.—Travelling expenses and cost of rations to men undergoing practical part of Transport course.
vii.—Travelling expenses for officers and men undergoing yearly repetition courses.

Attendants.—

(i)—Cost of good-conduct pay and better pensions.
(ii)—Difference of cost between present and proposed issue of clothing.
(iii)—Difference of cost between present and proposed compensation for dearness of provisions.
(iv)—Amount of extra hutting allowance, and of cost of extra tents.
(v)—Cost of swords and sword-belts (deduct cost of present belts).
(vi)—Pay of 1 subadar-major to each Transport-section.
(vii)—Difference of pay between present scale and proposed scale of jemadars and subadars, in each section.
(viii)—Cost of Reserve of attendants; pay, clothing, arms, &c., &c.

Registration.—

(i)—Pay and allowances to extra officers possibly required as registering officers.
(ii)—Pay and allowances of salutris, Transport agents, and clerks, for each district.
(iii)—Bonus to owners.

On the other side of the balance-sheet we have:—

(i)—Money obtained for hire of transport to individuals.
(ii)—Money obtained for hiring transport on contract.
(iii)—Fines obtained from owners of registered transport.
(iv)—Saving obtained through transport being kept almost free of expense by (*a*) individuals, (*b*) departments.
(v)—Saving obtained on mobilization by good and perfected arrangements for supply of officers, subordinates, and transport.

With these headings to go upon, I think that any one could, with sufficient data at his command, work out a fairly approximate estimate of the expenditure.

Pioneer Press, No. 899.—18-7-96.—850.

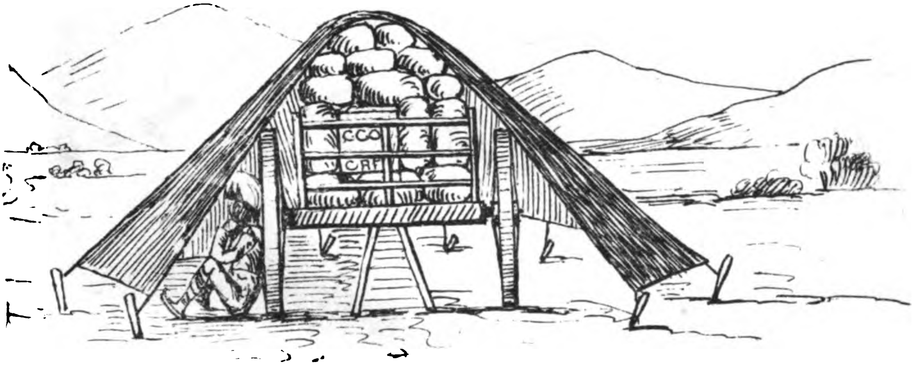

Fig. I.

ACCOMMODATION OF TRANSPORT DRIVERS.

Diagram showing how the water-proof paulin of the Army Transport Cart might be pegged down so as to form a rough shelter for the drivers.

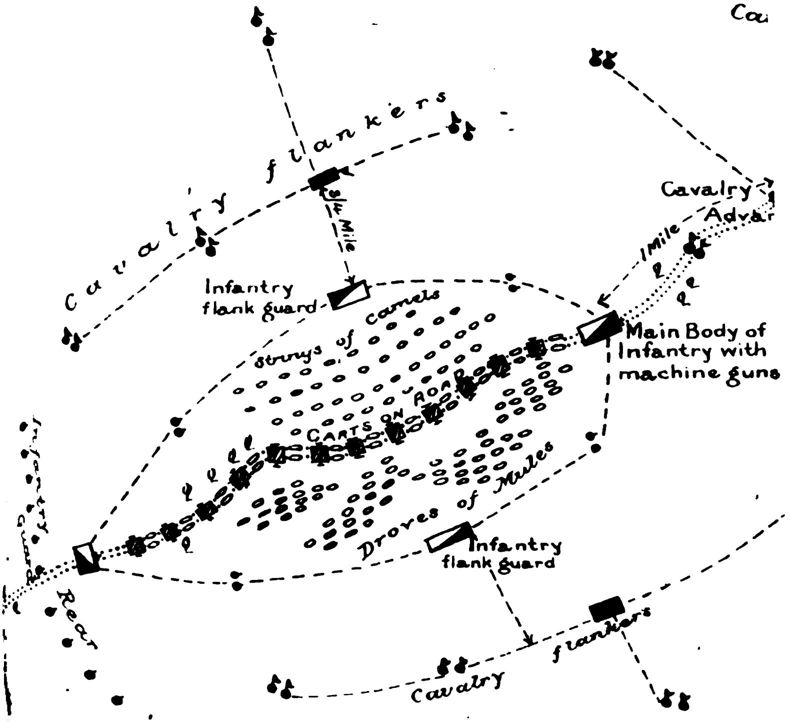

Fig. II.

MARCH FORMATIONS FOR CONVOYS.

Rough sketch to illustrate suggested march formation for wheel and pack transport over a fairly open and level country.

1. Carts move along the track or road.
2. Pack animals move on each flank.
3. Cavalry of escort covers the front and flanks
4. Main body of Infantry marches at the head of the column.
5. Guards are told off to protect each flank.
6. Rear guard.

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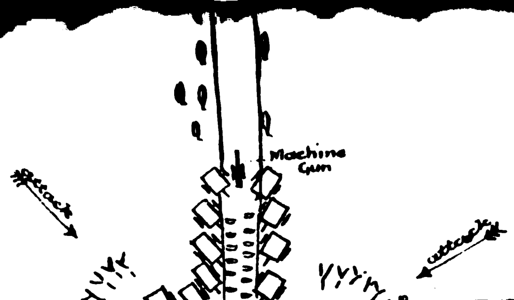

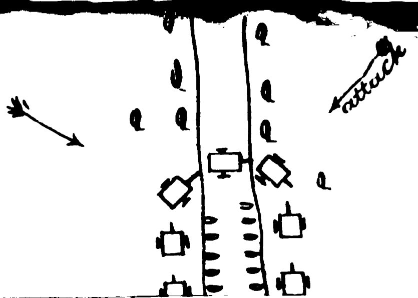

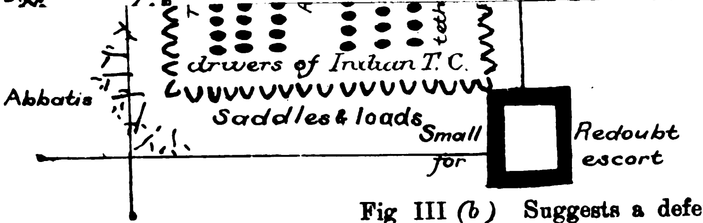

Fig III (*a*) Suggests a formation which a convoy might assume to repel an attack where plenty of time is available.

1. Carts are in two lines facing inwards, poles and shafts towards the road.
2. A few carts are moved off the road so as to give flank defence.
3. Transport animals tethered in double rows inside the enclosure.

Fig III (*b*) Suggests a defensive formation which might be assumed where time presses

In both cases the escort would fire in two tiers; some from the carts, others from beneath them.

Fig. III (*c*) Suggests a defensive formation suitable for a convoy composed entirely of pack animals The redoubts for the escort might be shelter trenches, sungars or breastworks of Commissariat Stores. &c. The Central Zareeba would be defended by the armed drivers of the Indian Transport Corps.

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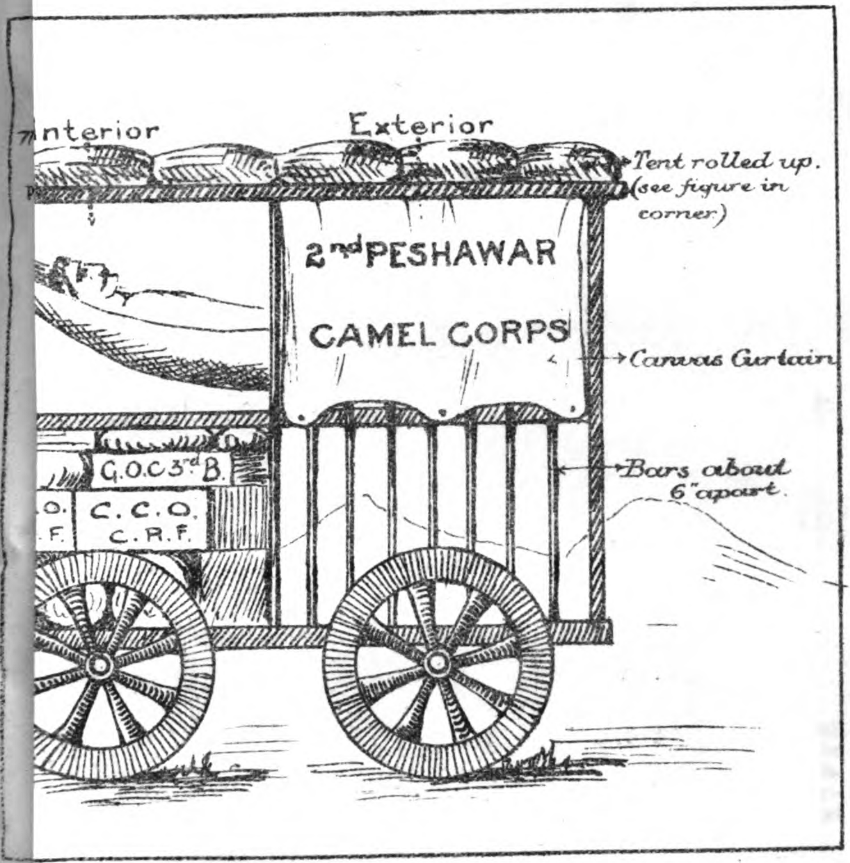

nd Balúchistán The cart
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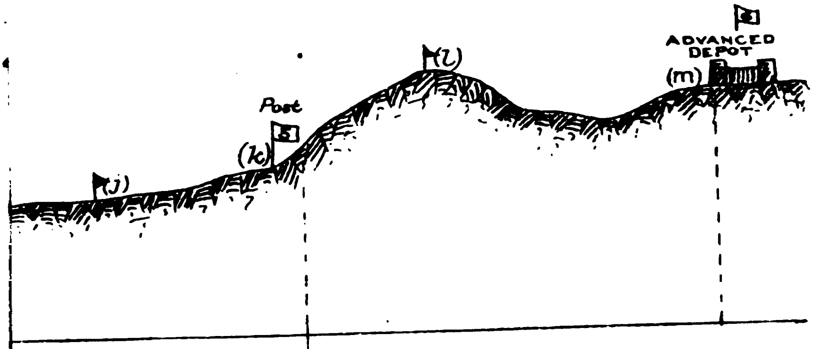
a.



Section 5.
(*i*) to (*k*) light tramway, amel, and bullock carts.

Section 6.
(*k*) to (*m*) pack mules, hill camels, and elephants for heavy stores.

Advanced Depot.
Stores would here be issued for the army and distributed by regimental transport units.

illustrating

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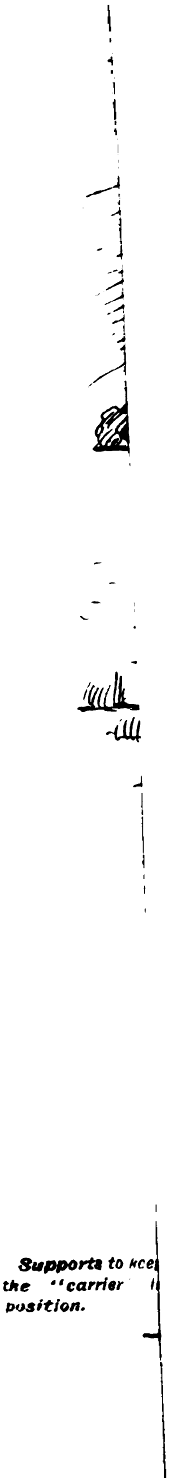

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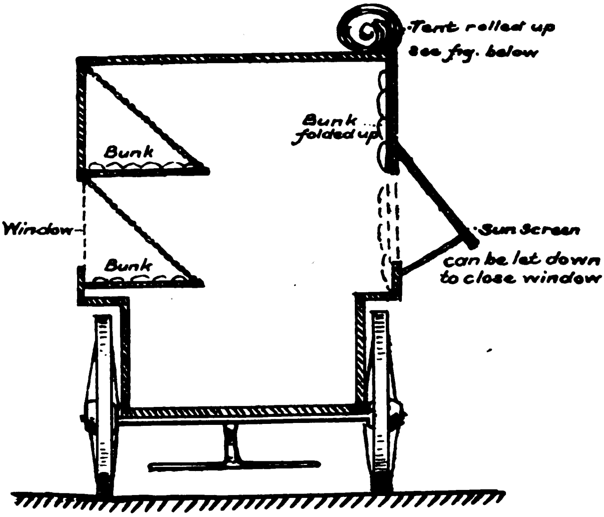

Fig. VIII *(b)*

Section of Van showing interior.

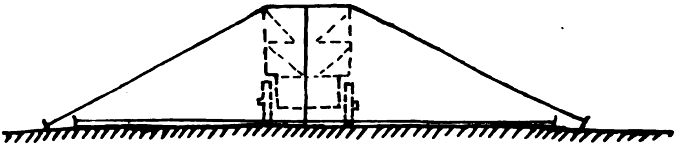

Fig. VIII *(c)*

Sketch showing how extra accommodation may be provided when the van is halted by letting down a tent canvas on each side.

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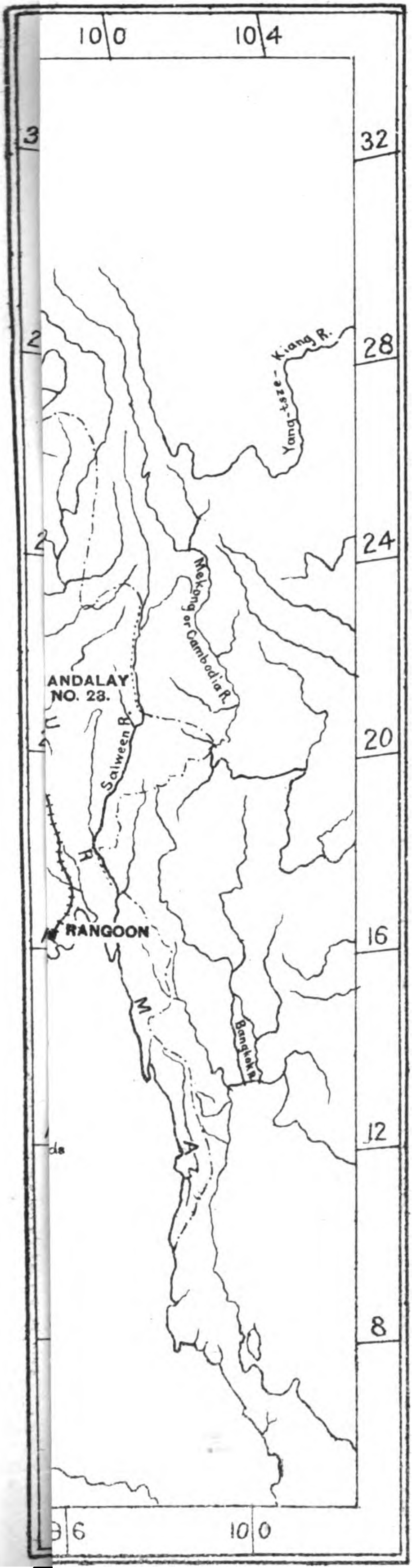
NON VI SED SEMPER CADENDO."



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CAVALRY ARMAMENT.

BY LIEUTENANT-COLONEL P. NEVILLE, 14TH BENGAL LANCERS.

> "*Superiority of armament gives increased chances of victory in war. It does not of itself gain battles, but it is a decided element of success.*"—JOMINI.

The question of the best armament for cavalry is one which has for centuries occupied the attention of military authorities in all the Great Powers of Europe, and, strange to say, it is a question which does not seem even yet to be definitely and satisfactorily settled. The principal point at issue is, putting minor points aside, whether the lance or the sword is the better weapon, and, as a side issue, whether the front ranks should not be armed with the lance and the rear ranks with the sword. There seem to have been at various times epidemics, so to speak, of enthusiasm for one or the other arm. We see nations discarding the sword for the lance at one period of their history, and at another reverting to the sword and carbine.

Germany at present favors the lance, and in India, during the past quarter century, a number of Native Cavalry regiments have discarded their national "*tulwár*" for a lancer armament.

No living writer has gone more thoroughly into this subject, or brought a greater battery of erudition to bear upon it, than Lieutenant-Colonel Elliot, Commanding the 3rd Bengal Cavalry; and in this short paper (for I have no intention, even if I had the ability, of dealing exhaustively with so wide a subject) I shall make frequent quotations from his pamphlet published in 1890 and entitled "Notes on Cavalry Literature treating more especially of its armament."

Colonel Elliot's conclusion is that the lance is the more suitable weapon for the shock, and the sword for the subsequent *mêlée*.

In this most cavalrymen will agree, but here we are but at the commencement of the problem, which really is, how the same man may be enabled to first attack with the lance and immediately afterwards employ the sword as his weapon. Going back to the Middle Ages we find the heavy-armoured knights charging in line, armed with very long and heavy lances. They were followed at some 40 or 50 paces by a second line composed of their esquires and men-at-arms who carried swords. If the charge was successful, this second line, joining in the *mêlée*, helped to complete the victory; if, on the other hand, the knights suffered a reverse, they were enabled to rally and re-form behind this second line. It will be remarked also by the student of history that, after the first shock, the knights discarded the heavy lance and laid about them stoutly with mace, battle axe, or sword.

Before considering the three-fold question—*i.e.*, lance in both ranks, sword in both ranks, or lance in front and sword in rear ranks—I will give some quotations from Colonel Elliot's book to show the various opinions of recognized authorities on the subject; and by authorities I mean not only writers who have devoted time and study to the subject, but also and more especially men who have been expert leaders of large bodies of cavalry in the field, and whose *dicta* are based on actual experience in war.

In 1811, Napoleon, by a decree dated the 11th November of that year, attached a regiment of lancers to each division of cuirassiers, thus rècognizing the principle that the lance is useful in the front rank only.

In "*Les Tendances actuelles de la Cavalerie Russe,*" by Sainte Chapelle, Paris, 1886, a full account of the recent transformation of the Russian cavalry is given, from which it appears that by a ministerial decision, dated April 1883, the regiments of Don Cossacks have preserved the lance, but in the front rank only. The commission charged with the enquiry on this subject give the following reasons in support of their decision:—"If the horsemen of both ranks have the lance, the result in a charge will be as follows :—At the moment of impact, either the front-rank man will strike his adversary and leave the lance in his body, or if he has missed, it will be because the latter has taken off the point of his weapon with his sword. In either case the lancer will find himself unarmed in the *mêlée;* and, *a fortiori*, the rear-rank man, who charges with his lance carried and disengaged from the boat, will be disarmed also; whilst if the front rank only have the lance, the rear-rank man, charging sword in hand, will be able to come up to the support of their front-rank men."

An article entitled "Les Transformations de la Cavalerie" in the *Revue de Cavalerie*, 1886, gives a full account of lancers and their suppression in the French and Austrian armies. The writer is an enthusiast for the lance. In 1870, towards the end of the Franco-Prussian war, the Colonel of the 5th Lancers telegraphed to Paris for permission to discard his lances and use rifles instead, on the ground that he could not perform properly outpost duties in front of the army. General de Laverdo, of the Ministry of War, telegraphed in reply—"Prenez modèle, pour éclairer l'armée, sur les Uhlans Prussiens, qui sont armés de lances."

Marmont favoured the lance for the front rank only :—"Il faudrait en armer le premier rang de tous les regiments de ligne et de grosse cavalerie."

Latour-Maubourg, at the battle of Dresden, 27th August 1813, made repeated attacks on the Austrian squares, but failed in them all until he placed fifty lancers of his personal escort in front of the cuirassiers.

These lancers made a breach in several squares, through which the cuirassiers poured, and so broke the left wing of the Austrian army.

In an article, "Encore la Lance," in the *Revue de Cavalerie*, 1890, the writer says: "In Germany up to the present time there were only 25 regiments, out of a total of 93, armed with the lance. Under recent orders issued by the Emperor, there are now 35 equipped with the new armament, and 39 if the four regiments of heavy Saxon and Bavarian cavalry are also to receive the lance." Quoting Lieutenant-Colonel Elias, of the English army, he says: "Quoi qu'il en soit, l'opinion de ceux qui conseillent d'armer le premier rang de lances mérite d'être examinée. Pour nous, Anglais, qui avons si souvent à combattre contre des Afghans, des Arabes, et autres guerriers Asiatiques courageux, il est vrai, mais pourvus de mauvaises armes à feu, la lance serait d'une grande utilité, cas ces ennemis se couchent à terre dans le mêlée et ils deviennent dangereux dans cette position où le cavalier ne peut les atteindre avec son sabre."

The truth of this was proved very decidedly in the Afghan campaign of 1879-80. The enemy threw themselves down when charged by cavalry and slashed up with their heavy knives as the cavalry passed over them, inflicting in numerous cases mortal wounds on our men. Swordsmen were unable to reach them with their sabres, but our lancers gave such a good account of the enemy that they quickly learned to dread the lance, which is undoubtedly the "Queen of weapons" when employed against infantry.

"So far as native horsemen are concerned," writes Colonel Elliot, "it is absolutely necessary to eradicate from their minds the feeling that they are 'incapable of it.' They know (few better) the difference between a sharp *tulwár* and a blunt sword. They know from personal experience what the lance can do and what it cannot do. Some day these men may be called upon to face the fire of magazine rifles. To do this with any chance of success, they must feel and know that they have the best armament in the world, and not the second best only. Second best armament means second best troops, and as it costs no more to feed and pay the best than the second best troops, a wise policy would seem to be to consider these matters while it is day. . . . . Asiatics have in all ages and in all countries supplied their want of physical strength (as compared with Europeans) by the very simple process of never using edged weapons, such as swords, knives, daggers, scimitars, etc., *unless they had a razor-like edge*, and with which, from their natural construction, they can inflict terrible wounds. The Hindustani *tulwár*, Mameluke sabre, Afghan knife, Malay creese, Ghoorka *kukri*, Turkish scimitar, Albanian yataghan, Persian sabre, Japanese sword, are all practical examples of the truth of the above statement. . . . . Nolan quotes many instances which tend to show that irregulars armed with *sharp* swords, and having a proper command over their horses, have over and over again severely punished English dragoons of far greater physical strength and moral courage than themselves."

The above goes to prove that if cavalry are to be armed with the sword, the sword must be *sharp*, and not the blunt steel bar which is in vogue in our army to-day. This is of little use except to parry, unless when placed in the hands of a second Sampson, who, it may be remarked, might do as good execution with his traditional jaw-bone of an ass.

Wellington was of opinion that the rear rank at close order was of no use to the front rank:—"I think that the second rank of cavalry at the usual distance of close order does not increase its activity. The rear rank does not strengthen the front rank, as the centre and rear ranks do the front rank of infantry. The rear rank of the cavalry can augment the activity, or even the means of attack, of the front rank, only by *a movement of disorder.*" This tends to prove that our present system of charging with the rear rank at close order is vicious and unsound. If this be true for hussars it is doubly so for lancers, for the rear-rank lancer, charging at full speed *eight feet* in rear of his front-rank man *with his lance at the "carry" in the bucket,* is not only practically helpless and useless at the moment of impact, but also he is a source of danger to his front-rank man.* Jomini, Marmont, Roche-Aymon, Okouneff, all are in favour of the lance in the front rank only. Saxe, Poniatowski, Latour-Maubourg, DeBrack, Roginat, Gouvion St. Cyr, Foy, Morand, Colbert, Pajol, and Napoleon recommend the use of the lance and sword in conjunction, each weapon in its proper place, the one supplementing and correcting the defects of the other.

Sir Charles Napier looked on native horsemen as men of the sword, and was of opinion that their own national *tulwár* was for them the best weapon. He was dead against "dragooning" the irregular cavalry of India. He did all he could to ridicule the idea that Asiatic horsemen could be expected to become the counterpart or duplicate copy of English dragoons, but, as he says, in his letters, without the least success.

The events of 1857 swept away in one day the regular Native Cavalry with their blunt swords, long stirrups, and slippery saddles, to be replaced by corps like those commanded by Probyn and Hodson, whose men, being left to choose their own horses, saddlery, weapons, etc., according to their native ideas of what was really suitable, very soon convinced all concerned before Delhi and Lucknow that the wisest policy is to recognize the fact that the irregular native horseman has one way of fighting:—and the European dragoon another.

These modes of fighting, utterly distinct, are well contrasted by Nolan.

"As Sir Charles Napier said, the European trooper's downright blow splits the skull; the native sowar has, as a rule, neither the strength nor the nerve for this style of warfare, so he, with cunning artifice, instead of brute force, arrives at the same object by a delicate drawing cut (from the wrist) across a limb, which in nine cases out of ten severs some artery or blood-vessel. The result is the same, though the weapons employed are quite different."

Sir Charles Napier, writing on the subject, says: "The slicing of the Eastern horseman's razor-like scimitar is terrible."

The Book of the Sword, by Sir Richard Burton, 1884, is a masterpiece on the subject. Of curved or straight swords the author says:

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* A British cavalry officer who has served many years with both hussars and lancers writes:—"I can assure you that when the 'charge' sounds for a real conflict, the rear-rank men bring their lances to the 'engage' also; not likely men are going into an enemy with their lances at the 'carry.' If they had swords it would do away with the above danger."

"The straight sword, used for thrusting, is hard to handle when the horse moves swiftly, and the broad straight blade loses its value by the length of the plane through which it has to travel. On the other hand, the bent blade *collects*, like the battle-axe, all the momentum at the 'half weak,' or centre of percussion, where the curve is greatest. Lastly, the drawing cut would be easier to the mounted man and would most injure his enemy."

"This *dictum*," says Colonel Elliot, "finally disposes of the popular fallacy that a straight sword is best for a *mounted* man. It is the best for a man *on foot* in the shape of a rapier, but introduce the horse into the question and the conditions are altered at once, as Burton clearly explains. . . . The *tulwár*, or half-curved sword of Hindustan, cuts as though it were four times as broad and only one-fourth of the thickness of the straight blade. But the 'drawing cut' has the additional advantage of deepening the wound and cutting into the bone. *Hence men of inferior strength and stature used their blades in a manner that not a little astonished and disgusted our soldiers in the Sind and Sikh compaigns.*"

There can be little doubt that against infantry the lance is the best weapon for both ranks, but in cases where the sword, scimitar, or other cutting weapon is the *national* arm of the troops, it would seem a doubtful policy (at all events in the case of Asiatic troops expert in the use of the sword) to replace this by the lance, which is a weapon requiring great strength of arm to wield successfully, and, as we have seen, Asiatics have not the strength or nerve of Europeans in the fight.

That the sword may be victoriously employed against infantry is demonstrated by current events in Cuba, where the inhabitants are engaged in a fierce struggle for liberty against the Spaniards. In *The Illustrated American* of April 25th, 1896, there is an interesting article on the "Machete," Cuba's favorite weapon:—

"While military experts have been telling us for years that the new conditions of modern warfare have made the cavalry charges obsolete, we read nearly every day of Cuban victories won by cavalry wielding the 'terrible machete.' This machete (pronounced 'machetty') is the implement for all needs throughout Spanish America. This blade is first cousin to the sabre of our own cavalry, but while the sabre serves only for one purpose, the machete serves many, and is as useful in peace as in war. Almost every Spanish American above the age of childhood carries a machete. With this the labourer cuts his sugarcane, prepares firewood, and trenches the ground for his crops. The horseman wears the machete because with this he cuts his way through the woodlands during journeys over rough country. It is sword, spade, and hedging bill-axe, hatchet, and pruning knife. You may have the machete in nearly thirty different forms. . . . Two things have made cavalry conspicuous in the Cuban war, at a time when men had begun to think of the cavalry sabre as sure to take its place with the lance among the weapons of the past. First, every Cuban owns a machete and may own a horse. Given 50 Cubans with horse and machete, and you have for purposes of this war an effective troop of cavalry. Again, nearly every engagement of the war has been fought on rough ground where the infantry hollow square could not be effectively formed.

"Cavalry can rarely penetrate the square of infantry, bristling with bayonets and ready to pour volley after volley into an advancing foe. But, on the other hand, infantry, formed as troops must be upon the rough Cuban battle-fields, cannot easily withstand the charge of cavalry armed with the terrible machete."

A glance at the present state of affairs in Cuba will show how much the insurgents have effected, principally by their cavalry. The rebel army numbers about 40,000 men, who have only a limited amount of ammunition obtained chiefly from abroad. The Spanish army consists of 135,000 regular troops of all arms and 40,000 volunteers drawn from Spanish residents of the island. And yet at the present moment the Spaniards are acting purely on the defensive. Most of their troops are locked up in garrisons along a line of 22 miles extending from the outskirts of Havana to the southern coast in the vicinity of Mariel. In the meanwhile the rebel chief Antonio Maceo remains quietly in Pinar del Rio awaiting further supplies of ammunition from the United States before again assuming the offensive.

Given, then, for the sake of argument, that the lance is the *best* arm for cavalry when opposed to infantry, it would follow that divisional cavalry should have the lance in both ranks; and as for attack formation, several lines in single rank would seem to be the best adapted for the purpose. For the independent cavalry division acting at a distance ahead of the army against the enemy's cavalry, the consensus of opinion is in favor of one armament of about equal lances and swords, but the question still is most how best they may be distributed.

Shall we have brigades consisting of one lancer and one hussar or dragoon regiment, the whole acting in single rank? The Duke of Wellington was a great advocate for the rank-entire system, and so have been many other distinguished soldiers. If we adopt such an organization, the lancers must form the attacking line, and the hussars, riding some 50 paces in rear, must take the place of the present rear rank. The drawback to this arrangement is obvious. The two ranks belonging to different regiments and having different commanders, would no longer be homogeneous; there would be no unity of command. It might succeed for an attacking, or first-line brigade, riding straight to its front; but for the supports and reserve, where sudden formations for offence or defence must be rapidly assumed, or where units have to be thrown into the fight at various points, unforeseen, the multiplicity of commands and the difficulty of manœuvre combine to condemn such an organization.

Shall we adopt the system of lances in the front rank and swords in the rear? This at first sight would seem to be a solution of the difficulty. It most closely resembles the tactics of the Middle Ages. The front rank might, after charging, if the *mêlée* were too crowded to give them free scope for their weapons, copy the knights of old, and, discarding the lance, draw their swords. If they were victorious there would in all probability be ample opportunity for recovering their lances after the fight. This system, however, presents the difficulty that in every home charge a certain number of lances are always broken or lost. This has been estimated at about 12 per cent., so that after about eight charges—not too many for a regiment to expect in, say, a week's campaign—there would be no lances left. It might be possible in some theatres of war for the divisional train to bring up large reserve supplies of lances, but again, in very many other situations, and certainly on our Indian frontier, this would be impossible, and each regiment would have to depend on such arms only as they were able to carry for themselves.

It would seem to be imperative, therefore, for every man to carry a lance in lancer regiments. How, then, should we meet the requirements of the recognized proposition that the lance is the best weapon for the shock and the sword for the *mêlée?*

The first solution that suggests itself is that the rear-rank men should sling lances on their left arms and use the sword. This is but a makeshift at best, and has the disadvantage that the horseman is hampered in the management of his horse by the lance hanging on his bridle arm; moreover, if in the *mêlée* a lance, thus slung, comes out of the bucket, the rider will be very heavily handicapped, as his horse is liable to become quite unmanageable on account of the lance getting mixed up in his hind legs.

The next solution is that while on the line of march each man carries a lance, on turning out for parade the rear-rank men leave their lances in camp and parade with swords.

In this case, after each engagement the loss of lances before alluded to would tend to swell the rear rank of swordsmen and deplete the front rank of lancers. A proposal has been put forward of late to have a jointed lance made in three pieces which the rear ranks could carry strapped across their backs. This scheme certainly merits a careful examination, as if a strong joint quickly adjustable were devised the idea has great possibilities of usefulness, and the lance thus strapped across the shoulders, as the carbine is sometimes worn, would prove a shield against sword-cuts, whilst inconveniencing the rider as little as might be. Until such a lance has been approved of, perhaps the simplest plan would be for every lancer on service to carry his lance as above on the march, but, on mustering for parade, the rear rank to leave their lances in camp, with the exception of four men per field troop, who should carry the lance on their left arms. This would allow a reserve of 16 lances per squadron to replace casualties.

If this suggestion be adopted, the front and rear ranks should be equalized, and not as at present; moreover, it is essential that some regulation for the manœuvre of the rear rank during the charge should be promulgated. The least distance between front and rear ranks should not be less than eight horses' lengths, and this might with advantage be increased to 25 or 30 yards.

Finally, if we would utilize fully the principle of lance and sword combined, each supplementing and correcting the faults of the other, as recommended by Napoleon, we must teach our troops the proper use of these weapons.

The mere putting men through the lance and sword exercises until they can perform them without a mistake, is not sufficient. European troopers armed with a cut-and-thrust sword must be taught to fence, and native horsemen armed with their national *tulwár* must be taught to *cut.* No sword exercise will teach this; nothing but actual practice in cutting with a true edge on foot and on horseback. The drawing cut requires practice, which alone ensures perfection. No exercise except actual cutting will suffice to teach the use of the sword. If sheep and other animals are too expensive, a very good substitute will be found in a bundle of sugarcane which may be procured in most localities in India.

So far we have considered the best armament for divisional cavalry, whose objective will be, in all probability, the enemy's infantry. We have also seen that, taking the consensus of opinion of recognized authorities on the subject, lancer regiments should carry, every man, a lance, but that when parading on service, the rear ranks, with the exceptions noted, should leave their lances in camp or with their baggage guard in rear. It now remains to be considered how best to distribute in the independent cavalry division the regiments armed with swords. Taking, as a general principle, that lancer regiments and those armed with the sword, be they dragoons or hussars, should be of equal strength, we should have in a division of nine regiments—*i.e.*, three brigades of three regiments each—either five regiments of lancers and four of swordsmen, or five of swordsmen and four of lancers.

In the first case, let us see how the lances and swords ought to be distributed. The lance has been proved to be the weapon best suited for the shock of attack: therefore, beyond doubt, our first or attacking line should be lancers. Assuming for the purposes of the present consideration that a brigade of three regiments is a suitable force for the attacking line, we have, in the first line, three regiments of lancers. The second line, or supports, may be disposed either on one flank (the exposed flank, if there is one) or on both flanks; and as this is also an attacking line, intended to deal with the second line of the enemy, these regiments should also be lancers (two regiments). There remain the reserve and the "surprise squadrons."* These squadrons have not to attack in the first instance, but to fall on the rear of the enemy after the shock; they should therefore be swordsmen, and not lancers. If we distribute three squadrons to the first line, or attacking brigade, and one to the supports (Plate 1, Fig. 1), we shall have remaining three regiments armed with the sword for the reserve. That the reserve should be composed of swordsmen is indicated by considerations on the proper use of the reserve, for which there is no place in this paper. In my opinion, the reserve is a body of troops at the disposal of the General Officer Commanding, from which successive units—be they squadrons, wings, or regiments—are to be thrown into the fight as it develops. It follows that their services will not be called upon until the *mêlée* stage is reached, when, as we have seen, the sword is the better weapon.

Should one division, however, be outnumbered, and should five regiments in the first line and supports not be equal to cope with the enemy's array, then a whole regiment, or even more, may have to be detached from the reserve previous to the *mêlée* stage, *but these should be kept well back in echelon on the exposed flank, and not pushed up into the fighting line.*

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* These squadrons will in future replace the useless "succour squadrons." Their mission is to fall on the enemy's rear immediately after the shock, each field troop acting independently under its own leader.

Plate. 1.

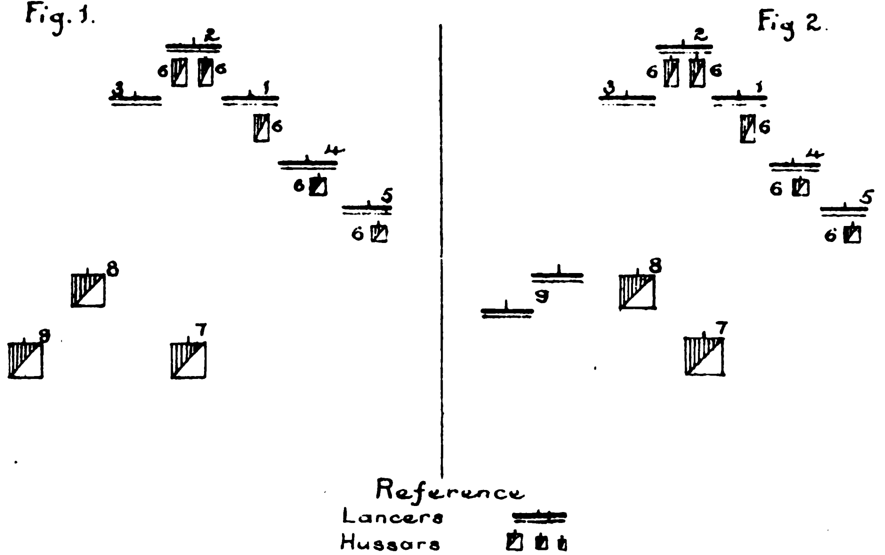
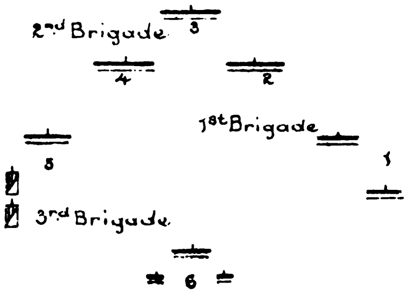


Fig. 1. Fig 2.

Showing the distribution of swords and lances in a nine-regiment Division

Plate. 2.



Showing the distribution of swords and lances in a six-regiment Division

In the second case of four regiments of lancers and five of swords men, the attacking line would still be composed of three regiments of lancers, the supports of one regiment of either arm, and the reserve as efobre. (Plate 1, Fig. 2.)

Where the division is composed of six regiments—*i.e.*, three brigades of two regiments each*—the attacking line would still seem to be best constituted if the three lancer regiments be placed therein.

The remainder would be armed with the sword, and would most probably be disposed—two regiments as supports, and one in reserve.†

That this distribution of the cavalry division into three lines is not by any means obligatory, must be clearly understood. There are no fixed rules that arbitrarily govern the employment of cavalry against their own arm. There is no reason, under certain circumstances, why the whole division should not attack in a single or double echelon of regiments, or even wings—the general principle being observed of putting the lances forward in the fight and keeping the swords, as far as may be, for the *mêlée*.

The difficulty which meets us on most military questions is that of arriving at any definite conclusion on a given subject. Colonel Neville gives us some hope of obtaining a satisfactory answer to the question which he desires to solve.

It would be interesting, in future numbers of the Journal, to have the opinions of those who have given thought to the subject; for we might find that there existed a very general agreement as to the armament best fitted for cavalry work.

We shall all most probably agree with Colonel Elliot's conclusion that the lance is the weapon for the shock and the sword for the subsequent mêlée, and this gives the discussion a definite point of departure.—Ed.

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* (Plate 2.)

† In the case of so small a division acting alone, the surprise squadrons must be dispensed with.

THE IMPROVEMENT OF THE PRESENT ORGANIZATION OF TRANSPORT IN INDIA.

By Captain E. J. Medley, 17th Bengal Cavalry.

Motto: "*Oh reform it altogether.*"

I.—How the present Organization Arose.

"We feel that there can be no doubt in the mind of anyone who has studied the history of Indian wars that an efficient transport service is the first requirement of an army on a campaign. Unless supplies of food for men and horses, reserves of ammunition for rifles and guns, and sufficient hospital appliances are always present with an army in the field, the men can neither march nor fight. . . . . In India, and in Asia generally, even more than in Europe, the rule holds good that a small, fully-equipped force, which can act at once, and strike sharp, prompt blows, is more efficient and far more economical than a large army, which can only take the field after months of preparation."

We feel that no apology is needed for the above quotation from the Report of the "Army Organization Commission" which was assembled in 1879, for it is upon the recommendations of this Commission that is founded the transport system at present in force in India.

In the words of the Commission, "the old system, under which Indian armies were put into the field in past years, had broken down in the Afghan campaigns of 1878-79," and the Commission was set the task of devising a scheme which should fulfil requirements in time of peace, and be capable of expansion in time of war. Let us, before proceeding further, examine shortly the system which had failed to stand the test of the Afghan wars, and the scheme propounded by the Commission to replace it.

Up to 1861 practically no transport was maintained in time of peace. For movements of troops in relief, or for campaigns, transport was hired as required. But "The lessons of the Mutiny taught the Government that for the maintenance of internal order, and for the prevention or repression of disturbance, it was necessary that small bodies of troops should be able to take the field at a few hours notice in different parts of the country."

Accordingly in 1861 orders were issued for the maintenance at 43 different stations of a small supply of carriage sufficient to place in the field an effective moveable column of all arms. Besides this moveable column carriage, every mountain battery and every corps of the Panjab Frontier Force was allowed to maintain sufficient mules and camels to enable them to take the field at once.

The moveable column carriage was under the charge of the Commissariat Department, while the Panjab Frontier Force carriage was in regimental charge.

The total amount of transport maintained was sufficient to carry 74,000 maunds, and its total annual cost was nearly 38 lakhs of rupees.

When the Afghan War broke out, however, it was found impossible to utilize the whole of this carriage. It was scattered all over India, "from Karachi on the west to Tonghoo on the east; from Peshawar in the north to Trichinopoly in the south." Moreover, even if it had been possible to utilize this carriage in Afghanistan, it was not considered desirable to do so, as to withdraw entirely the moveable column carriage from the interior of the country might have led to grave political complications.

Consequently the Commissariat Officers had to hire through contractors, buy in the market, or impress through the civil authorities, such additional carriage as was required. The whole of the transport thus collected was worked under the Commissariat Officers, who were thus burdened with this charge in addition to their own primary duty of providing and distributing supplies.

The result, as might have been anticipated, was absolute and hopeless disruption. On the outbreak of the second phase of the war, the transport service was entirely reorganized, and separated from the commissariat. It was placed on a purely military footing, and consequently proved fairly efficient. Unfortunately, however, judging from the fact that the only transport that had proved at all efficient during the first phase of the campaign was that with the Frontier Force regiments, it was concluded that this so-called regimental system was the one to adopt. It was not seen that the chief and only reason why the Frontier Force transport had stood the test so much better than the commissariat transport was because it was the only transport with any semblance of organization about it.

This organization was not by any means a perfect one, and however adapted for war it may be, cannot possibly be maintained in peace, owing to its prohibitive expense. However, what was wanted just then was a war organization, and consequently a certain number of animals were attached to regiments and called "regimental transport," while a certain number of other animals were told off to each post along the line of communications and were designated "general transport."

When the Organization Commission assembled in 1879 they had only the results of the first phase of the war to guide their deliberations.

In this phase, as already mentioned, the only transport that had not hopelessly broken down was that attached to the Frontier Force regiments.

The Commission accordingly recommended that the future system should be a regimental one,—*i.e.*, that the greater part of the transport to be kept up in peace should be in charge of regiments, while a certain amount to be kept up for station work should be in departmental charge.

The Commission then went on to say that, "after much consideration, we have come to the conclusion that the transport service should be a branch of the Commissariat Department;" and this despite the appalling breakdown which had only just been witnessed in the war, caused by burdening the Commissariat Department with transport duties, and in the teeth of the organization of a separate transport department entirely unconnected with the commissariat which was being formulated at that very moment in Simla for the second phase of the war. (For details of this organization we may refer the reader to the U. S. I. Journal, No. 46, page 62.)

The die was cast, however; the recommendations of the Commission were eventually acted upon, and transport has remained a subordinate branch of the Commissariat Department up to the present day.

II.—The present Organization.

Shortly stated, the transport organization at present in force in India is as follows :—

In Time of Peace.

In time of peace the following amount of transport is maintained :—

Transport.	Depôt.	Regimental.	Total.
Elephants	114	207	321
Camels (Government)	100	700	800
Do. (hired)	2,317	...	2,317
Pack mules	5,666	4,962	10,628
Do. bullocks	118	232	350
A. T. carts (mule)	585	160	745
Do. (bullock)	1,543	...	1,543
Draught mules	1,170	320	1,499
Do. bullocks	3,086	...	3,086
Mates and porters	117	117	234
Maundage of above transport	45,431	16,408½	61,839½

This transport is, in the case of Depôt Transport, in charge of the Commissariat Department, and in the case of Regimental Transport under its supervision, though attached to regiments.

It is stationed in 29 military districts, at 238 cantonments.

Four of these districts and 50 of these stations are in Burma, Aden, and the Persian Gulf, from which places it would not be feasible to withdraw it for service on the north or north-west frontier of India.

Except for active service this transport, both depôt and regimental, is confined within the limits of its own military districts. The transport of each district, whether in depôt or in regimental charge, is entirely under the control of the General Officer Commanding the District. A regiment leaving a district on relief must hand over its transport to the relieving regiment, or the transport of one regiment may be transferred to another regiment in the same district by order of the General Officer Commanding.

The only thing that a General Officer Commanding cannot do is to order regimental transport to be handed over to a depôt. For this the sanction of the Commander-in-Chief must be obtained.

The distribution of the transport throughout India has apparently been governed chiefly by the rules for mobilization, though the location of the depôt transport, it would seem, has been influenced to a large extent by commissariat and local military requirements.

Besides the transport enumerated above, each Silladar Cavalry regiment has attached to it a certain number of Government mules. The total number of mules thus kept for Government, and free of any expense to it, is 3,073.

The attendants for these mules are provided and paid for by regiments, Government paying the attendants when they proceed on privilege leave, and giving each attendant Rs. 18 deferred pay after three years' attested service.

The only condition imposed on Silladar regiments is that they shall, on the outbreak of war, hand over to Government their mules and their attendants, receiving them back after the campaign.

As regards attendants for the depôt and regimental transport, they are provided through the agency of the Commissariat Department.

The authorized proportion of attendants to animals is given in Army Regulations, India, Volume V, paragraph 1852. Generally speaking it is in the proportion of one attendant to every three animals.

Attendants are engaged for a period of not less than two or more than three years, which may be prolonged (without their consent), in case of a war, to the end of the campaign. They are neither enlisted nor attested.

Transport in regimental charge is supervised by a British officer, who should, if possible, have a transport certificate, assisted by a certain number of non-commissioned officers and men of his regiment.

The depôt transport, though nominally in charge of the Commissariat Officer of the Depôt, is in all matters of detail looked after by a "transport agent."

These agents are practically entrusted with the entire charge of the transport, except that they are not allowed to disburse pay to the attendants.

A transport agent has to deposit a security of from Rs. 800 to Rs. 1,500, and his pay ranges from Rs. 30 to Rs. 50 per mensem according to his standing.

In order to provide for a reserve of fully qualified officers and assistants, not only to take charge of regimental transport during peace, but for transport duties in the field, certain "training depôts" have been established, at which a certain number of officers, non-commissioned officers and men, both British and Native, can undergo a six weeks course under the Commissariat Officer of the Depôt, followed by a three weeks practical training as transport officer to a corps on the line of march.

There are 19 training depôts in various parts of India.

As regards a reserve of animals and attendants, there is none. Upon the Chief Commissariat Officer of each district, however, is laid the burden and responsibility of compiling statistical information regarding the resources of the country in and around his district as regards carriage, men, gear, equipments, contractors, etc.

This information the Chief Commissariat Officer is enjoined to obtain with the aid of the civil authorities and to keep it registered up to date. For this enormous mass of extra and most important work no extra personal or other form of assistance is given to the Chief Commissariat Officer.

Such, in general outline, is the present organization of the transport in India in time of peace.

The cost of its up-keep is about 45 lakhs of rupees, including ambulance. It is very evident that this amount of transport is far in excess of the peace requirements of the country, and were this the only, or, indeed, the main consideration, it is clear that it would be immeasurably cheaper to adopt the old system in force up to 1861, and hire the ordinary country transport, when it is wanted for reliefs or manœuvres, in preference to maintaining a mass of transport, which cannot by any possibility repay Government for its cost.

The theory that the peace requirements of India should govern the transport organization was, however, exploded by the first phase of the Afghan War of 1878-79, and since then the whole object of maintaining transport in peace time has been as a preparation for war. Let us see then how the present organization is adapted for the requirements of the army on a campaign.

In Time of War.

Wars in which the army in India may be called upon to take part may be classed under three heads—

(*a*) Campaigns across the frontier.
(*b*) Campaigns over sea.
(*c*) Punitive expeditions on the frontier.

The mobilization scheme at present in force in India is designed to meet the exigencies of (*a*) alone.

(*b*) is looked upon as such an exceptional occurrence (though India has supplied a contingent to supplement the force from England on more than one occasion during the last fifteen years) that it is considered sufficient to defer consideration of mobilization plans until a call is made upon us.

(*c*), like the poor, we have always with us, but the expeditions are, as a rule, small and uneventful, and it is thought best to issue detailed orders adapted to the circumstances of the moment when each expedition takes place.

Owing to various causes, chief among which may be mentioned the Waziri Expedition, the absence of roads preventing the use of any artillery but mountain, also of army transport carts, it is difficult to look upon our latest campaign as a fair or a full test of our mobilization scheme, especially as regards the transport question.

At the same time it must be pointed out that an organization which depends entirely on circumstances favourable to ourselves, and does not easily adapt itself to war, from whichever direction it may come, but is framed to meet one particular set of circumstances, can hardly be said to fulfil all requirements.

However, we will leave this point for the present, and consider the scheme as it would work under the conditions to fulfil which it has been designed.

The mobilization scheme at present in force provides for the mobilization of the 1st and 2nd Divisions of all Arms, and their concentration at Peshawar and Chaman respectively.

The total transport required for each division with its respective Lines of Communication troops is stated to be approximately as follows :—

Transport Animals	7,000
Do. Carts	175

To the above must be added nearly 600 carts belonging to the Imperial Service transport trains, attached to the 1st Division on mobilization.

Roughly speaking, all existing corps units, which are to form part of the 1st and 2nd Divisions and their Lines of Communication troops, have attached to them in peace time all but five per cent. of their transport. This consists entirely of mule and A. T. cart transport.

The infantry, however, both British and Native, have on mobilization to get their camel transport at the equipping station.

The mule transport to complete the above-mentioned corps units, as well as for all staff and departmental units, is maintained in the transport depôts of the districts in which the units to be supplied will be mobilized.

As some 15,000 mules are maintained in peace time in India, it is considered that no more mules will require to be purchased.

As regards camels, however, the case is different. Only 800 Government camels are maintained in peace, and it is estimated that some 13,000 camels, 14,000 draught bullocks, and 300 carts will have to be purchased or hired if both divisions are mobilized.

For procuring these, officers will be told off at various centres, and will have to go out into the neighbouring country to make the purchases.

Finally, as regards the administrative portion of the mobilization scheme for transport, the master mind which is to direct all and bring order out of the chaos which must inevitably result when large numbers of utterly untrained attendants and animals are in question.

According to the regulations on the subject, two Commissariat Officers will be appointed to each Brigade and Division Staff, one as Commissariat the other as Transport Officer, but the Commissariat Officer is made responsible for the efficiency of both commissariat and transport.

Now there are only 130 Commissariat Officers for the whole of India. At least 18 of them will be required for each division, including the line of communications, besides a large number of regimental officers as assistants (some 70 regimental officers were thus employed in the late Chitral campaign, besides all the transport officers with regiments, who of necessity were unable to perform their purely military duties). Such then is the organization of the transport, as designed for war.

Its Merits and its Defects.

Let us consider shortly the good and bad points of this scheme and let us see whether it is the best and cheapest organization that can be devised for both peace and war.

In peace time in depôt charge there is sufficient transport to carry 45,000 maunds, while the amount of transport in regimental charge is equivalent to 16,000 maunds.

This amount of transport is kept up in peace, as already explained, solely as a preparation for war.

Does it fulfil its object?

And, first, as regards the actual numbers. It would be easy to show by figures that despite the enormous number of animals maintained in peace time, by far the larger number of animals and their attendants with a mobilized division and on its line of communications will be the hastily purchased or hired or enrolled unorganised mobs with which the Afghan War made us acquainted, and that if such raw material is placed in charge of young and utterly inexperienced officers, as it necessarily must be, the same *fiasco* will result.

That this is not mere surmise is shown by the fact that out of 35,000 animals employed on transport duty in the Chitral campaign, over 25,000 were hired or purchased on the outbreak of the war. We feel pretty certain, too, that the proportion of untrained to trained officers was just as great.

Next with regard to organization. The so-called regimental transport is not really regimental, but is merely attached to certain regiments at certain stations. When these regiments are relieved they hand over their transport to the incoming regiment, in the same way as their lines or their barracks are handed over. Transport that was really regimental would remain as much a part and parcel of a regiment as its arms or its horses.

Such a transport would undoubtedly be most efficient, but it is impossible on account of its prohibitive expense.

Furthermore, no regiment in India can, even under present circumstances, start on a campaign without a certain number of men and animals being attached to it at the last moment to supplement deficiencies.

Even on service this transport cannot be considered regimental, for it will constantly be necessary to vary the distribution of the transport work, and to take the mules of a cavalry regiment and send them with the infantry, who might be going along a route impracticable for camels; or to take the transport of a regiment to bring up stores, etc.

Now, not only do such transfers cause endless confusion, but after the animals of a regiment have been once or twice taken from it, all concerned lose their interest in such transport, and cease to look upon it as regimental—a name to which indeed it has no claim.

Next, as regards the depôt transport. This is merely a haphazard collection of animals and attendants at each depôt which forms a sort of reserve for supplying regiments for peace and also for war purposes. It is impossible that any sort of cohesion or organization should exist among such groups of animals or attendants. There is nothing to prevent an attendant and his three mules from being at one station at one time, and miles away at another time.

On service, too, an attendant may be attached to half-a-dozen different sections in succession, and have to depend for his pay on as many different officers.

Such a state of things, as was clearly proved during the Afghan War, does not conduce to either regular payments or to good work.

We are then forced to the conclusion that neither in depôt nor in regimental transport is there any form of organization worthy of the name, and that, consequently, the transport must inevitably fail when put to the test of war.

Despite the order on the subject that, except in the matter of camels, all units should be furnished with their complete supplies of mules at their mobilization stations, it is pretty certain that in very many cases in connection with the late Chitral campaign it was not found possible to carry out these orders.

Whether the reserves maintained at the transport depôts proved unequal to the strain imposed upon them, or whatever was the cause, the fact remains that field hospitals left not only their mobilization stations but even the base without even a single kahar or dooly; regiments marched without tents; the railway poured in stores to Nowshera, merely for them to lie there, waiting for days for transport to take them on; and even those hospitals that did get kahars and mules found the former were mostly the riff-raff of the bazars, who had never so much as seen a dooly before, much less carried one, while the mules were too often young and untrained and utterly unsuited for ambulance work.

The cause most likely to conduce to failure under the present organization is, however, to be found in the absolutely superhuman task imposed on a Commissariat Officer at a depôt, when mobilization is ordered.

To complete certain regiments with spare mules, to exchange sound for unsound or unfit animals, to procure and furnish hospitals with mules, kahars, servants, etc., to give all the statistical information that he has collected to the officers told off to purchase and hire animals, these are but a few of the numerous duties he has to perform, not one of which are, even remotely, connected with his own proper work of supply.

In fact herein lies the crux of the whole question of transport organization.

Much has been said on the question of the commissariat control of transport. The arguments both for and against may be summed up as follows:—

In favour of the transport being controlled by the Commissariat Department, it is urged that—

(*a*) It has always been so.

(*b*) Its influence is great among contractors.

(*c*) It has continual dealings in peace time with these people, and consequently it can obtain men and animals in great numbers when required for war.

(*d*) It is accustomed to deal with the civil authorities.

(*e*) The men in its employ are acquainted with the system of supply to men and animals.

(*f*) To work the transport requires no further office organization than already exists for supply work.

(*g*) It is easier and cheaper in peace time for the Commissariat to be responsible for finding the necessary men and animals for transport and hospital work, as it has the means of utilizing them in supply work.

(*h*) The department responsible for the supply of food, which is of vital importance at all times, must have undisputed control of the transport, so as in war to prevent accumulations at the depôts in rear.

(*i*) It is only by having complete control of the transport that proper arrangements can be made for procuring forage and other local supplies during a campaign.

Against Commissariat control, the following very powerful reasons are adduced :—

(*a*) Since the time when transport has been maintained in peace no other control has been exercised, it is true, but that is no argument against any other control.

(*b*) A Commissariat Officer's supply duties are so onerous of themselves that he simply has not the time to attend to transport duties as well, either in office or as regards the practical part.

(*c*) This is proved by the fact that a "transport agent" is appointed to look after men and animals in every depôt in India.

(*d*) A Commissariat Officer is not, *ipso facto*, a better judge of a transport animal or a hospital kahar than anyone else, yet on him is placed the burden and responsibility of buying every animal for transport, and of furnishing every hospital with kahars.

(*e*) In war, the only times when transport has been really successful have been when transport has been organized on a purely military footing and entirely separate from the commissariat.

(*f*) *"By assigning the direction of the moving power to an officer in any way connected with one of the administrative departments we run the risk of his being swayed to favour the department he is connected with, to the detriment of the rest."

(*g*) The General Officer Commanding has a greater stake than the Commissariat Officer in maintaining all transport efficient, and has more influence and power to make his wants known and complied with.

(*h*) The Commissariat Officer would be relieved of great labour and anxiety as regards transport, and so could give his entire attention to his supply work.

(*i*) The Commissariat might just as well claim to control the Naval service or the Railway service as the Transport service.

(*j*) As long as Commissariat control exists, no organization or improvement will be possible, and each war will see the same mistakes repeated and the same complaints made as have hitherto happened.

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* Furse's "Lines of Communication in War."

(*k*) No matter how efficient the *personnel* of a Commissariat Department, or, on the other hand, however inefficient it may be, the result will always be the same under its control.

(*l*) Finally, in the words of Major-General Von Schellendorf, in his description of the duties of the General Staff, " it would, however, be at the expense of the other troops and of the mass if the utilization of the means of transport were not regulated by a purely military and impartial hand attentive in meeting the most varied needs in the order of their importance and of their urgency."

After this too brief survey of our transport organization we are forced to the conclusion that in peace it is far too costly and cumbersome for requirements, while in war, owing to the absence of any real organization, and to want of expansive power in it, in General Young's expressive words : " Droves of men and animals will again be handed over to regiments a few hours before they march, transferred from corps to corps, or from transport officer to transport officer, the animals will again be starved and ill-treated to death by hundreds, their equipment be lost, and the establishments themselves be kept in a discontented and inefficient state from their pay being months in arrears, all as before, and all without any possibility of tracing the blame or effecting a remedy, and all this (as before), notwithstanding all officers are working their hardest."

III.—PROPOSED ORGANIZATION.

It will have been gathered from what has been said above that we are strongly opposed to transport being worked either in peace or in war by the Commissariat or indeed by any department. Until the evils inherent in this departmental system are fully realized and thoroughly appreciated, as indeed they are in every army in the world except in the Indian army, it is hopeless to expect any improvement in the transport organization in India. There is practically no organization to improve, and the only improvement possible is in starting *de novo*.

Now transport " has so long been looked upon as a departmental matter that it is difficult to divest the mind of preconceived ideas on the subject to the extent necessary in order to realize properly the working of a system which would introduce an entire and radical change into its whole management."* And yet this is absolutely necessary if we wish for improvement.

Under the present system the department concerned with transport is one of the administrative departments under the Government of India direct. Now transport is essentially an executive matter.

The first step in any improvement, then, which is undertaken, must be that of placing it directly under the Commander-in-Chief, under whom it should form a fourth " Arm " of the service.

Transport is as distinctly a speciality as a railway, and specialists are required to work both properly.

Both time and space here prevent us from doing more than giving an outline of the organization proposed. If, however, the principles here advocated are approved of, it will not be difficult hereafter to work out the details connected with the scheme. The organization proposed is somewhat on the lines of the present Royal Artillery organization. Just as the latter is divided into "Horse" and "Field," so should the "Transport Corps" be divided into "Camel," "Mule," or "Cart" Trains.

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* "U. S. I. Journal," No. 57, p. 1.

Each "Train" would be a complete unit in itself, but as it would not always be convenient or even possible to employ a whole "Train" on all occasions, each "Train" would be subdivided into five "Troops," while each "Troop" would be further divided into four "Sections."

Neither "Train," "Troop," nor "Section" should be reckoned as to its strength by a certain number of animals or vehicles, but by its carrying power or "maundage." When an indent is submitted to a railway company for the carriage of goods, the number of vehicles, each of so much carrying capacity, is not specified, but the railway is left to provide carriage for a certain number of "maunds" of goods. As far as a regiment or a department is concerned, it matters not to them how the baggage or the stores are carried, so long as they are carried. The class of conveyance to be provided will be settled by the General Officer Commanding; in peace according to the class of the "Trains" stationed in his district, and in war with reference to the exigencies of the moment and the nature of the transport best fitted for the particular work in hand.

Whether the Chief Staff Officer for Transport in India should be equal in standing to the Adjutant-General or Quartermaster-General, and have a separate office of his own, or whether he should be a Deputy of the Quartermaster-General, is a detail which it is not necessary to discuss here; the broad principle advocated is that he should be an officer directly under the orders of the Commander-in-Chief. His title would probably be the "Director-General for Transport."

For each of the four Commands it is proposed to have a "Director of Transport," who should be on the staff of the Lieutenant-General.

In each district, according to local requirements and also with a view to mobilization, there would be stationed a certain number of "Trains." The class of train to be stationed in each district would likewise be regulated by the above-mentioned consideration.

Under the system at present in force, speaking generally, mules are Government property at all times; camels however are, except in certain very special cases, not kept up at all during peace time, but are hired or purchased on the outbreak of a war.

This general rule it is here proposed to keep to, but with this difference, that whereas at present all organization of mules or camels into definite bodies is postponed till the actual commencement of hostilities, by which time it is too late to do anything in the way of real organization; under the system here proposed, not only will this work be done in peace time, but it will be done so effectively that the organization will be adapted for any form of active service or for any sort or description of country. There will be no need of working out several different "scales" of transport for each individual unit, as has to be done at present; which "scales" are almost certain to be modified at the last moment because war has broken out in a part of the world which in active operations was not contemplated when the various "scales" were drawn up; all that will be requisite will be that it should be settled at Army Head-quarters what class of transport will be best adapted for the country in which the troops are called upon to operate, and that class of transport can at once be despatched.

A "Train" of whatever class will always carry 1,000 maunds.

A "Troop" of whatever class will be designed to carry 250 maunds.

A "Section" of whatever class will carry 60 maunds.

With these "data" there will be no difficulty in working out the strength of each "Train" and of each of its subdivisions.

Before going into details on this point, however, it will be as well to state here the general principles governing the organization.

As it is proposed that the Mule and Mule Cart Trains should be permanently embodied, while the Camel Trains should only exist, till actually wanted, in the form of cadres, it will be as well to discuss each class separately.

(*a*) "MULE TRAINS."

Each "Mule Train," it is proposed, should have two British officers with it in time of peace. These officers should be obtained in the same way as officers are obtained for the Burma Police,—*i.e.*, the Commandant should be appointed for five years, and the second-in-command for three years, both being seconded in their regiments.

Each "Troop" would be commanded by a Jemadar of the native cavalry.

Each "Section" should be commanded by a Duffadar, who should be obtained from the native cavalry in the first instance, but later on, when the system is in full working order, and a better class of men is obtained for drivers than is possible under the present system, it would be better to promote the best men from among the drivers to the rank of "Section Duffadar."

The Native officers, like the British, might be seconded for three or five years, or might rejoin their regiments on their promotion to Ressaldar. This point could be settled afterwards.

Each "Mule Train" is divided into five "Troops." Four troops only will proceed on service, the fifth will form a depôt troop into which will be drafted the unfit drivers and mules. The second-in-command would remain at the depôt at first to purchase and equip fresh mules, and to send them on to the front when required to replace casualties. There would be no need under the system here advocated to obtain fresh drivers, as it is proposed to have one driver to every two mules in peace time, while for service there would be one driver to three mules.

One great drawback to the present system is that it provides for no reserve of drivers. Mules or camels can almost at once be sent on service without any special training, but hastily enrolled and perfectly untrained drivers are absolutely useless, and are the cause of most of the losses suffered in transport animals in all our campaigns.

It is proposed that under the scheme here advocated all drivers should be attested, or, what would be better still, enlisted.

Drivers should be obtained, and mules purchased, by the officers directly responsible for working them. In the present instance this work would devolve on the Commandant of each "Train." If the mules are to remain the property of Government, their clothing, equipment, food, etc., would be obtained, as in British or Madras cavalry regiments, from the Commissariat and Ordnance Departments. But if, as proposed further on, the Silladar system is adopted for all trains, all the above articles would be found by the regiment.

In Table (A) is given the composition of a Mule Train and its carrying capacity, and Table A shows its annual cost.

(b) "MULE CART TRAINS."

These would be on exactly the same footing as the "Mule Trains," except that instead of two British officers with each "Train" there would be only one. If it was thought advisable, each Cart Train could be affiliated with a Mule Train solely for the purpose of having its depôt provided with mules through a British officer; but this is not absolutely necessary, as the Native officer left with the depôt troop of the Cart Train, if worth his salt, could well be depended on to keep his train up to the mark with animals and drivers during a campaign. Table (B) gives the composition and carrying power of a "Mule Cart Train," and Table B its annual cost. The carts would be the present two-mule Army Transport cart.

(c) "CAMEL TRAINS."

A "Camel Train" would be on somewhat of a different footing to either of the preceding. It would only be embodied when actually required. This might be either for ordinary relief work or for a campaign.

It was proposed by the late Major Martin, of the 2nd Bengal Lancers, a few years ago, in a pamphlet advocating the adoption of the "Silladar" system for the transport, that the staff for camel trains should be drawn entirely from Silladar Cavalry regiments, and that each regiment should provide a staff for one "Train."

Whether the "Silladar" system is adopted or not, we think the proposal as to the formation of the staff should be adopted.

There are 37 Silladar Cavalry regiments in India, and if each regiment were to be responsible for raising one "Camel Train" we should obtain a force of over 8,000 camels organized in trains of 220 camels each.

As, according to the mobilization scheme, not more than 5,000 camels are required for the regimental transport of two divisions, it would perhaps be sufficient if cadres for the Camel Trains were furnished in peace time by those regiments alone who do not form part of the two divisions to be mobilized.

At present the work of registering camels and drivers is placed in the hands of the already overburdened Commissariat Officers. When the camels are embodied for service they are put in charge of Non-Commissioned officers and others, who may or may not have any knowledge of such animals; the probability is that the vast majority of those concerned with this work have not the very slightest knowledge of the work they are put to. By telling off the staff for each train in peace time, and making them responsible for obtaining all information about the resources of the part of the country where they are to procure their animals in the event of active service, we should make certain of having camels definitely registered, together with their drivers, and the men who had registered them in peace would be those who will have charge of them in war. Thus both parties would be acquainted with each other beforehand, which would materially conduce to smooth working on service. It would not make the slightest difference under this system whether the camels were Silladari, or Government, or hired.

It is proposed that a British officer, four duffadars and four sowars, from each Silladar Cavalry regiment, told off to raise a "Camel Train," should be told off in peace time for a certain district. They should make themselves acquainted thoroughly with the resources of their district as regards camels and their drivers, and should settle with them beforehand at what price they will let out on hire for a campaign themselves and their animals. If it is thought desirable to give a retaining or registering fee, it should be given by the staff of each "Camel Train," but we think that no fee would be necessary, as long as the men and drivers are not required to report themselves at any particular place. It would probably be sufficient if the staff spent a fortnight in their district twice a year to keep their registers up to date, and themselves in touch with their train. While employed on this duty, they should be given travelling allowance under the ordinary rules, but during the rest of the year it would not cost Government anything.

All details connected with the telling off of the camels and their drivers into "Troops" and "Sections" could be done in peace time, so that when they were ordered to mobilize, all would be ready.

It is proposed to maintain in peace time six Camel Trains, which will be permanently embodied; these would do the work and take the place of the 800 Government camels and the 2,317 hired camels which are kept up in time of peace under the present organization.

The composition and carrying capacity of a "Camel Train" is given in Table (C), while its annual cost is shown in Table C.

It is not necessary here to discuss the "Bullock Cart" and "Elephant" Trains. Details connected with them are shown in Tables (D) and (E) respectively, while the annual cost of each is shown in Tables D and E.

Now the question arises as to which is the cheapest system on which to work these "Trains."

Are the animals in the case of mules to be the property of Government, and in the case of camels to become the property of Government on mobilization, or to be merely hired for a particular campaign; or is it better and cheaper to introduce the "Silladari" system?

The introduction of the "Silladari" system, as already mentioned, was strongly advocated by the late Major M. K. Martin, who had had a considerable amount of experience with transport both in peace and in war. He gave it as his deliberate opinion that "without a pecuniary interest in the animals in his charge, no matter under what supervision, no native, whether he understands his work or not, will ever take the necessary care of a transport pack animal as regards feeding, watering, saddling and keeping his gear in a serviceable condition that is requisite to keep an animal for any length of time capable of doing work."

The essence of the "Silladari" system is that "the Officer Commanding a mule or a camel train would practically take a contract from Government to have a certain number of men, animals, gear, clothing, etc., always ready for service in return for a certain monthly rate of pay, and would render himself personally responsible if they were not so.

Under the "Silladari" system, then, all mules and camels would be "Train" property. Every driver would have a direct pecuniary interest in his animals as his pay would be made to depend on the fitness or otherwise for service of the animals in his charge.

If it should be decided that this is, in the long run, as it most undoubtedly is, the best and by far the cheapest system to adopt, the procedure would be roughly as follows. We wish it clearly to be understood, however, that the military organization of the transport into "Trains" as advocated, is not in any way whatever dependent on the adoption of the "Silladar" system. For the introduction of the latter a certain amount of capital is absolutely necessary, and if this is not forthcoming at the present time, it would be easy to introduce the "Train" system at once, leaving the mules Government property, and the camels to be hired as heretofore; leaving the introduction of the "Silladar" system until money was forthcoming.

In working the "Silladar" system, it would be necessary to make a small distinction between the mule trains and those composed of camels.

In the first place the mule trains are permanently embodied, while the camel trains will only be embodied for special occasions. Next, there is a very material difference between mule-drivers and camel-drivers. The former are, and would be even under the system of "Trains," poor men, and men not as a rule owning mules; while, on the other hand, the camel-drivers would most probably be the owners of their camels.

For these reasons, then, it would be advisable, as recommended by Major Martin, that while there should be a "mule price" levied from the mule-drivers, there should be none in the case of the camel-drivers.

As is often the case in Silladar Cavalry regiments nowadays, when a man is unable to pay up his horse price on enlistment, the money is lent him by the regiment and recovered from the man by fixed monthly instalments from his pay.

This would most certainly be the rule with the mule-drivers. It is for this reason that the ready money would be required to start this system. It might, however, be managed as follows if preferred. As Government has already in its possession a very large number of mules, advances to "Trains" might be made in mules instead of in money, and each train might be charged as an advance with the actual price of the mules handed over to it. In other words, each train, instead of buying its mules at the first start off in the open market, would buy them from Government. As in the case of the Silladar Cavalry regiments raised in 1885, these advances would be repaid by the "Trains" after a few years time, when their funds enabled this to be done.

With camel trains no actual purchases need be made, nor need any money be deposited. Each man would bring his three camels, which he would replace himself when any of them died. This was the custom formerly in the Silladar Cavalry, where each man brought a horse on enlistment, and replaced it when it became unfit for service or died.

It is impossible here to work out all the details as to mule and camel chundas, etc. If the principle is acknowledged, the details can be easily worked out afterwards. Any officer who has been connected with a Silladar Cavalry regiment will understand the system proposed, and could give all the necessary data for starting it.

The great advantage to Government in the Silladar system is that they know exactly what expenditure will be incurred.

The pay of drivers would necessarily have to be increased to enable them to subscribe to the various funds, but all other expenses in connection with transport will be cut down to absolutely *nil*. Everything under the Silladar system is found by the "Train."

If the expenditure over a term of years is taken, it will be found that that incurred under the Silladar system is immeasurably less than what is spent under any other system or organization.

There are certain things that should go with infantry everywhere, *viz.*, water, entrenching tools, and ammunition. The carriage of these is provided for under the present regulations under the head of "obligatory transport," which is always to be mules. Whether under the "Train" system the carriage of these articles with a regiment could always be arranged, or whether, as proposed by General Young, it would be necessary that these articles should be carried by *bonâ fide* regimental mules, experiment alone can show. We are inclined to think, however, that even in this case the "Train" organization would answer all requirements. All that would be necessary would be to attach two or three or more sections of a mule train to each regiment, either for an entire campaign, or for a definite period of time.

As regards commissariat requirements in peace time at a place where no train may be quartered, either a few carts might be kept up or hired by the Commissariat Department for that particular place, or, if preferred, a section or two of a train might be detached from its head-quarters to do the necessary transport work. The latter method would be the cheaper of the two and would be a means of utilizing transport in time of peace.

We have yet two points to consider in connection with the transport question—

(*a*) Most economical employment of transport in peace time.
(*b*) Financial aspect of proposals.

As regards (*a*) it is clear that under the proposed system there will be no greater difficulty in employing the transport economically in peace time than under the present system. On the contrary, with the transport organized in "Trains," and with drivers enlisted for long service, by allowing a certain number to go on furlough each year with their mules, on a rate of pay somewhat less than their ordinary pay, it will be possible to reduce the cost very considerably.

Another advantage that the proposed system has over the present one lies in the fact that the prices for hiring or purchasing camels will be fixed in peace time by those who will have the camels in their charge in war. At present this is impossible. The Commissariat Officer is responsible for registering animals in time of peace, while another officer altogether is told off to buy or hire on the outbreak of war the animals that yet another officer will take charge of.

As regards the financial aspect of these proposals, that rock on which so many schemes have been wrecked, this could be controlled far more easily with a transport corps organized in "Trains" than under the present system of depôt and regimental transport.

In the latter case there are so many things to be taken into consideration that control of expenditure on transport is almost impossible.

With organized trains the cost would depend entirely on the number of trains maintained.

In Table F is given the annual cost of the British officers of the proposed "Transport Corps." The total number with the corps in peace time will be 78. If during war more are wanted, they can always be obtained from those officers who have already served their three or five years with the trains, and have rejoined their regiments; but it will be found that the services of such extra officers will not be required except in the case of a very big war, when extra trains might have to be raised.

The *personnel* of the peace organization of the trains, composed as it would be of Native officers and non-commissioned officers, would be amply sufficient for all ordinary wars.

In Table G is set forth the number of trains it is proposed should be maintained in time of peace. It has been based on present requirements as shown by the number of animals maintained at present.

The 68,000 maundage of the present organization includes every single animal that figures on the rolls, but of this amount 6,146 maunds is the equivalent of the mules kept in time of peace by the native cavalry, and 11,585 maunds is carried by hired camels; deducting these two items, the actual maundage would only be 50,000. Even this, however, takes no account of the sick and unfit animals, and allows of no percentage for casualties.

With the train system approximately the same number of animals will be maintained for a maundage of 48,000. This maundage can be carried at all times for certain, for it is exclusive of one depôt troop per train, into which all unfit and sick animals will be drafted; and, in addition, there is a liberal percentage allowed with the service troops for the replacement of casualties.

In fact, the maundage shown under the train system is an absolutely reliable factor, which can at all times be depended on.

In Table H the total annual cost of the scheme is shown to be 42¾ lakhs. It may be urged that the present organization only costs 45 lakhs, including ambulance transport, of which the proposed scheme takes no account.

It must, however, be taken into consideration that under present arrangements no transport officers whatever are provided, neither on the active list nor in reserve; and that it is never certain how much or how little of the transport is fit for duty at any one time. Furthermore, the number of drivers is most inadequate, and whenever any of the transport is sent on service a large number of absolutely untrained men has always to be added at the last moment to supplement deficiencies.

Under the organization proposed Government would know exactly where it was; 48 trains means a carrying power of 48,000 maunds at all times and seasons.

This carrying power is always ready, and could be moved to any part of the world at only a few hours notice. Even then there would still remain 48 depôt troops ready to fill up casualties in a very short time with trained men and animals. In short, the difference between the two organizations is the difference between a mob without leaders and a trained army. If the cost of both is approximately the same, it would seem to be better to adopt the organization which will provide the "trained army," in preference to throwing away money any longer on that which results in forming merely a "leaderless mob."

Finally, let us consider how this "Transport Corps" would work. Each class of train would be numbered throughout its class, *viz.*,—

1st Mule Train, 2nd Mule Train, etc.
1st Camel Train, 2nd Camel Train, etc.

Each train would be permanently stationed at the place best suited to local and mobilization requirements.

When it was necessary to move a regiment in relief, or for manœuvres, the Commandant of a train would be ordered by the General Officer Commanding the District to convey the regiment and its baggage to a certain point. The order would state the amount of maundage for which conveyance was required, and the requisite number of sections or troops would be provided by the Commandant of the train.

A similar procedure would be observed in the case of commissariat or ordnance stores.

For active service, too, the procedure would be the same.

When a line of communications is maintained, a section, troop, or even a whole train would be told off to each "Stage" of the line according to the daily amount of stores to be carried to the front.

The Commandant of a transport train would in fact be in the position of a guard of a railway train. As long as baggage or stores were in his charge, he or his subordinates would be personally responsible for them, and for their safe conveyance to their destination.

All this is so absolutely impossible under the present system, that even the regulations lay it down that "the convoy system will be adopted in preference to the stage system in despatching stores to the front, owing to the difficulties experienced in practice in fixing the responsibility in regard to loss or damage *en route*."

In other words, owing to the want of any organization in our present transport service, we have to content ourselves with the convoy system—a system admitted by all to be the least rational and the most expensive, instead of employing the stage system, which would enable us to utilize our transport resources to the fullest extent, and would be the means of saving large sums of money and the lives of hundreds of animals.

IV.—AMBULANCE TRANSPORT.

Ambulance, like depôt and regimental transport, is under the charge of the Commissariat Department. In war, however, it is worked by the field hospitals. We have already explained the system, so need not say more here.

The present system is undoubtedly an absolute failure.

The chief, indeed the only reason why the kahars and other hospital servants are recruited and paid by the Commissariat Department is stated to be because that department can utilize them in peace time as punkah-pullers and store-men. Unfortunately, the Commissariat seem to consider the work they can give the hospital transport to be the more important; consequently, when in war this transport is told off to its legitimate duties, it is, in nine cases out of ten, found to be absolutely inefficient.

We fail to see why the present process should not be reversed.

These attendants being enlisted primarily for hospital purposes should be entertained and belong to the department chiefly concerned,—*i.e.*, the Medical Department. When the Medical Department is not in need of their services, they can be lent for commissariat work.

Every kahar or laskar can pack or carry or load commissariat stores, but any coolie cannot carry a dandy or pitch a tent.

We have one other observation to make connected with hospitals, and it is this:—At present no field hospital or even a section of one exists in time of peace. When war breaks out, even a section of a field hospital is a number of people brought together from all parts of India. We venture to think that such an important unit as this should not be thus formed. We have not sufficient data to guide us in forming accurate conclusions, but it would seem to be better for all concerned if certain station hospitals were told off in peace time to find one, two, or more sections for a field hospital for war, and that every article that would be required by each of these sections should form part of this station hospital in peace time, even though, like kahars, they may be lent to the station commissariat officer.

As regards native field hospitals, it would not seem difficult to tell off, in time of peace, the regimental hospitals that should each furnish a section of a field hospital in war time.

V.—CONCLUSION.

In conclusion, we would venture to make a few remarks on the subject of transport generally.

It is very noticeable how we, in India, have become imbued with the idea that there is nothing like pack carriage. Even in our mobilization schemes, which are framed with the idea of fighting in countries where horse and field artillery will be able to go, the amount of "wheel" carriage allowed for is infinitesimal compared with the pack carriage. Now, when it is remembered that an animal can draw nearly three times as much as it can carry, it would seem to be absolutely suicidal and ruinous not to make more provision for "draught" animals than is the case at present. Even if carts cannot accompany the advanced troops, they can surely be made use of on the lines of communication.

Again, the question of the use of traction engines and trains has been much discussed in Europe, and it has been fully proved that a light traction train can go along even fairly decent roads at an average rate of eight miles an hour. Yet we have not moved in this matter in India at all.

When it is remembered that a traction train, instead of cutting up a road, as do pack animals and carts, actually helps to level and smooth the road it is driven over, it seems most strange that no attention has yet been paid to this most important subject out here.

Another method of transport which has not yet been introduced into Indian warfare is "Light Field Railways." For information on this point we beg to invite attention to the remarks made by Colonel Furse, C.B., in his work on the "Lines of Communication in War." A description of a light field railway, which would appear to be eminently suited to Indian requirements, is given on page 386, *et seq*.

As regards the use of light railways generally for war, Colonel Furse makes the following remarks, which, on account of the importance of the subject, we make no apology for quoting:—

"The desirability of substituting a field railway for animal transport in war is forced on our minds by the difficulties which always accompany the raising of special transport when any military operations have to be undertaken. Looking at the signal advantages which the improved means of locomotion by land and by water have conferred on trade, what is more natural for us than to strive to apply these to our requirements on active service? We are more than any other nation compelled to study this question, as our wars are constantly cropping up in most unexpected quarters. . . . . It may be alleged that to lay down a railway line would make a war very expensive, and would make the operations too slow. If we were to make a very complete estimate of all the direct and indirect expenses connected with the land transport in any of our past expeditions, we should find them to outbalance the cost of a light field railway, which, at the conclusion of a campaign, would be available for use on a future occasion. As for such a railway retarding the operations, it will, on the contrary, accelerate them, and render the supply service more regular and sure. . . . .

"To reap all the advantages a field railway offers in war, it is obvious that the plant must be kept in store, ready to be shipped to the base without delay. . . . . A field railway can be utilised at our camps-of-exercise—an arrangement which would furnish us at any moment with a body of men accustomed to laying and working it. It ill becomes us, who are proud of having laid the first railway in war, and who exult in our resources, to neglect to turn the inventions of the age to the best account in the field. Are we not tired of seeing our transport difficulties always cropping up anew? Are we never to try something novel and better?"

Another point requiring more attention than it has hitherto received is the advantage to be derived from the utilization along a line of communication of the particular class of transport best adapted for the varied sorts of country through which the line passes. To use mules along a level road is an absolute waste of power. In this connection we would draw attention to some remarks on this subject made by Major Carter in a lecture on "Mountain Warfare" given at the Royal

United Service Institution last year. They will be found on page 1077 of the "Journal" for November 1895.

This question of the best organization of the transport service has occupied much attention in India, but we regret to think that the results so far have not been commensurate with the time and thought bestowed on the question.

The truth is, as we have endeavoured to show in this essay, that organization has always hitherto proceeded on wrong principles, and it is only by starting afresh that we can hope for any real improvement.

May it not be our fate, when next war comes upon us, to be told by some old "Player" at the game of transport, "I hope we have reformed that indifferently with us, Sir," lest, in the words of Hamlet, we may again have to answer, "Oh reform it altogether."

TABLE (A).

MULE TRAIN.

4 Sections = 1 Troop.
5 Troops = 1 Train.

A Mule carries 2 maunds.
A Section carries 60 maunds.
A Troop carries 250 maunds.
A Train carries 1,000 maunds.

SECTION.

Peace.	*War.*
1 Duffadar.	1 Duffadar.
15 Drivers.	12 Drivers.
30 Mules.	35 Mules.

DETAIL.

60 maunds stores =	30 mules.
Section baggage =	3 ,,
Spare =	2 ,,
TOTAL	35 mules.

TROOP.

Peace.	*War.*
1 Jemadar.	1 Jemadar.
4 Duffadars.	4 Duffadars.
60 Drivers.	50 Drivers.
1 Saddler.	1 Saddler.
120 Mules.	140 Mules.

DETAIL.

250 maunds stores =	125 mules.
Troops' baggage =	8 ,,
Spare =	7 ,,
TOTAL	140 mules.

TRAIN.

Peace.	*War.*
1 Captain.	1 Captain.
1 Lieutenant.	
5 Jemadars.	4 Jemadars.
20 Duffadars.	16 Duffadars.
300 Drivers.	200 Drivers.
5 Saddlers.	4 Saddlers.
1 Salutri.	1 Salutri.
1 Assistant Salutri.	1 Assistant Salutri.
1 Farrier.	1 Farrier.
1 Writer.	1 Writer.
600 Mules.	560 Mules.

DETAIL.

1,000 maunds stores =	500 mules.
Train baggage =	25 ,,
Spare =	35 ,,
TOTAL	560 mules.

TABLE (B).

MULE CART TRAIN.

4 Sections = 1 Troop.
5 Troops = 1 Train.

A Mule cart carries 8 maunds.
A Section carries 60 maunds.
A Troop carries 250 maunds.
A Traiu carries 1,000 maunds.

SECTION.

Peace.	*War.*
1 Duffadar.	1 Duffadar.
8 Drivers.	8 Drivers.
17 Mules.	17 Mules.
8 Carts.	8 Carts.

DETAIL.

60 maunds and section baggage = . . . 8 carts.

TROOP.

Peace.	*War.*
1 Jemadar.	1 Jemadar.
4 Duffadars.	4 Duffadars.
32 Drivers.	33 Drivers.
1 Saddler.	1 Saddler.
32 Carts.	33 Carts.
69 Mules.	71 Mules.

DETAIL.

250 maunds and troop baggage = . . .	32 carts.
Spare = ...	1 cart.
TOTAL	33 carts.

TRAIN.

Peace.	*War.*
1 Captain.	1 Captain.
5 Jemadars.	4 Jemadars.
20 Duffadars.	16 Duffadars.
160 Drivers.	132 Drivers.
5 Saddlers.	4 Saddlers.
1 Salutri.	1 Salutri.
1 Farrier.	1 Farrier.
1 Carpenter.	1 Carpenter.
1 Blacksmith.	1 Blacksmith.
1 Assistant Blacksmith.	1 Assistant Blacksmith.
1 Writer.	1 Writer.
160 Carts.	132 Carts.
345 Mules.	290 Mules.

DETAIL.

1,000 maunds =	125 carts.	250 mules.
Train Head-quarters =	1 cart.	2 ,,
Native Officers and Non-Commissioned Officers =	1 ,,	2 ,,
Spare = . .	5 carts.	32 ,,
Riding Mules . .	. .	4 ,,
TOTAL .	132 carts.	290 mules.

TABLE (C).

CAMEL TRAIN.

4 Sections = 1 Troop.
5 Troops = 1 Train.

A Camel carries 5 maunds.
A Section carries 60 maunds.
A Troop carries 250 maunds.
A Train carries 1,000 maunds.

SECTION.

Peace.	*War.*
1 Duffadar.	1 Duffadar.
5 Drivers.	5 Drivers.
15 Camels.	14 Camels.

DETAIL.

60 maunds = . . .	12 camels.
Section baggage = . . .	1 camel.
Spare = ...	1 „
TOTAL .	14 camels.

TROOP.

Peace.	*War.*
1 Jemadar.	1 Jemadar.
4 Duffadars.	4 Duffadars.
20 Drivers.	19 Drivers.
60 Camels.	56 Camels.

DETAIL.

280 maunds = . . .	50 camels.
Troop baggage = . . .	1 camel.
Spare = ...	5 camels.
TOTAL .	56 camels.

TRAIN.

Peace.	*War.*
1 Lieutenant.	1 Lieutenant.
5 Jemadars.	4 Jemadars.
20 Duffadars.	16 Duffadars.
1 Saddler.	1 Saddler.
1 Writer.	1 Writer.
100 Drivers.	76 Drivers.
300 Camels.	224 Camels.

DETAIL.

1,000 maunds = ...	200 camels.
Train Head-quarters = . . .	1 camel.
Native Officers, Non-Commissioners and Drivers = . . .	9 camels.
Spare = ...	14 „
TOTAL .	224 camels.

TABLE (D).

ARMY TRANSPORT BULLOCK CART TRAIN.

4 Sections = 1 Troop.
5 Troops = 1 Train.

A Cart carries 10 maunds.
A Section carries 63 maunds.
A Troop carries 250 maunds.
A Train carries 1,000 maunds.

SECTION.

Peace.	*War.*
6 Drivers.	7 Drivers.
6 Carts.	7 Carts.
12 Bullocks.	14 Bullocks.

DETAIL.

60 maunds = . . .	6 carts.
Section baggage = . .	1 cart.
TOTAL .	7 carts.

TROOP.

Peace.	*War.*
1 Jemadar.	1 Jemadar.
2 Duffadars.	2 Duffadars.
24 Drivers.	29 Drivers.
24 Carts.	28 Carts.
48 Bullocks.	58 Bullocks.

DETAIL.

250 maunds = ...	25 carts.
Troop baggage = . .	1 cart.
Spare (1 pair bullocks) = .	2 carts.
TOTAL .	28 carts.

TRAIN.

Peace.	*War.*
1 Lieutenant.	1 Lieutenant.
5 Jemadars.	4 Jemadars.
10 Duffadars.	8 Duffadars.
1 Writer.	1 Writer.
120 Drivers.	116 Drivers.
2 Carpenters.	2 Carpenters.
2 Blacksmiths.	2 Blacksmiths.
2 Hammermen.	2 Hammermen.
2 Bellowsmen.	2 Bellowsmen.
1 Farrier.	1 Farrier.
120 Carts.	112 Carts.
240 Bullocks.	234 Bullocks.

DETAIL.

1,000 maunds = .	100 carts	200 bullocks.
Train Head-quarters =	2 „	4 „
Train baggage = .	4 „	8 „
Spare = . .	6 „	22 „
TOTAL .	112 carts	234 bullocks.

TABLE (E).

ELEPHANT TRAIN.

4 Sections = 1 Troop.
5 Troops = 1 Train.

An Elephant carries 15 maunds.
A Section carries 60 maunds.
A Troop carries 250 maunds.
A Train carries 1,000 maunds.

Section.		Troop.		Train.	
Peace.	*War.*	*Peace.*	*War.*	*Peace.*	*War.*
4 Mahouts.	4 Mahouts.	1 Jemadar.	1 Jemadar.	1 Lieutenant.	1 Lieutenant.
4 Coolies.	4 Coolies.	1 Duffadar.	1 Duffadar.	5 Jemadars.	4 Jemadars.
4 Elephants.	4 Elephants.	17 Mahouts.	17 Mahouts.	1 Writer.	1 Writer.
		17 Coolies.	17 Coolies.	85 Mahouts.	70 Mahouts.
		17 Elephants.	17 Elephants.	85 Coolies.	70 Coolies.
				85 Elephants.	70 Elephants.
				5 Duffadars.	4 Duffadars.
Detail.		Detail.		Detail.	
60 maunds = . . . 4 Elephants.		250 maunds and troop baggage = . . . 17 Elephants.		1,000 maunds = ... Train baggage = ... Spare = ...	67 Elephants. 1 Elephant. 2 Elephants. 70 Elephants.

TABLE A.

Approximate Cost of Mule Train (Government).

	Rs.	a.	p.	Rs.	a.	p.	Rs.	a.	p.
1 Captain	374	1	6	250	0	0	624	1	6
1 Lieutenant	225	12	0	150	0	0	375	12	0
5 Jemadars at Rs. 30							150	0	0
20 Duffadars at Rs. 15							300	0	0
300 Drivers at Rs. 7							2,100	0	0
5 Saddlers at Rs. 12							60	0	0
1 Salutri							30	0	0
1 Assistant Salutri							15	0	0
1 Farrier							15	0	0
1 Writer							30	0	0
600 Mules at Rs. 7							4,200	0	0
Total Monthly Cost							7,899	13	6
									12
							94,798	2	0
Deduct pay of British Officers							11,998	2	0
Total Annual Cost of Train							82,800	0	0

TABLE B.

Approximate Cost of Mule Cart Train (Government).

	Rs.	a.	p.
1 Captain	624	1	6
5 Jemadars at Rs. 30	150	0	0
20 Duffadars at Rs. 15	300	0	0
160 Drivers at Rs. 7	1,120	0	0
5 Saddlers at Rs. 12	60	0	0
1 Salutri	30	0	0
1 Farrier	15	0	0
1 Carpenter	10	0	0
1 Blacksmith	12	0	0
1 Assistant Blacksmith	7	0	0
1 Writer	30	0	0
345 Mules at Rs. 7	2,415	0	0
Total Monthly Cost	4,773	1	6
			12
	57,277	2	0
Deduct pay of British Officer	7,489	2	0
Total Annual Cost of Train	49,788	0	0

TABLE C.

Approximate Cost of Camel Train (Government).

	Rs.	a.	p.
1 Lieutenant (Commandant)	425	12	0
5 Jemadars at Rs. 30	150	0	0
20 Duffadars at Rs. 15	300	0	0
1 Writer	30	0	0
1 Saddler	12	0	0
100 Drivers at Rs. 7	700	0	0
300 Camels at Rs. 7	2,100	0	0
Total Monthly Cost	3,717	12	0
			12
	44,613	0	0
Deduct pay of British Officer	5,109	0	0
Total Annual Cost of Train	39,504	0	0

TABLE D.

Approximate Cost of Bullock Cart Train.

	Rs.	a.	p.
1 Lieutenant (Commandant)	425	12	0
5 Jemadars at Rs. 30	150	0	0
10 Duffadars at Rs. 15	150	0	0
1 Writer	30	0	0
120 Drivers at Rs. 7	840	0	0
2 Carpenters at Rs. 10	20	0	0
2 Blacksmiths at Rs. 12	24	0	0
2 Bellowsmen at Rs. 6	12	0	0
2 Hammermen at Rs. 7	14	0	0
1 Farrier	20	0	0
240 Bullocks at Rs. 7	1,680	0	0
Total Monthly Cost	3,365	12	0
			12
	40,389	0	0
Deduct pay of British Officer	5,109	0	0
Total Annual Cost of Train	35,280	0	0

TABLE E.

Approximate Cost of Elephant Train.

	Rs.	*a.*	*p.*
1 Lieutenant (Commandant)	425	0	0
5 Jemadars at Rs. 30	150	0	0
5 Duffadars at Rs. 15	75	0	0
1 Writer	30	0	0
85 Mahouts at Rs. 8	680	0	0
85 Coolies at Rs. 5	425	0	0
15 Elephants at Rs. 28	2,380	0	0
Total Monthly Cost	4,165	12	0
			12
	49,989	0	0
Deduct pay of British Officer	5,109	0	0
Total Annual Cost of Train	44,880	0	0

TABLE F.

Annual Cost of Pay of British Officers.

Officers.	Rate of pay.	Total monthly pay.	Total annual pay.
	Rs.	Rs.	Rs.
1 Director-General	2,000	2,000	24,000
4 Directors	1,200	4,800	57,600
25 Captains	625	15,625	1,87,500
25 Lieutenants (2nd-in-Command)	375	9,375	1,12,500
23 Lieutenants (Commandants)	425	9,775	1,17,300
Total Annual Cost of British Officers			4,98,900

TABLE G.

Number of Trains of each class maintained in Peace Time.

Class.	Present Organization.	Proposed Organization.	
	No. of Animals.	No. of Trains.	No. of Animals.
Elephants	321	4	340
Camels	800 (2,317)	6	1,800
Pack Mules	10,628 (3,073)	20	12,000
Pack Bullocks	350	...	...
Carts, Mule	745	5	830
Carts, Bullock	1,543	13	1,560
Draught Mules	1,490	5	4,725
Draught Bullocks	3,086	13	3,120

TOTAL MAUNDAGE OF PRESENT ORGANIZATION . . 68,000 maunds.

(Including mules with native cavalry regiments, which, however, are not available for Government in peace time.)

TOTAL MAUNDAGE OF PROPOSED ORGANIZATION . 48 trains, 48,000 maunds.

NOTE.—The camels and mules shown under "Present Organization" in brackets are "hired" camels and "Native Cavalry" mules.

TABLE H.

Total Annual Cost of Proposed Transport Corps.

Class of Train.	Number of Trains.	Cost per Train.	Total Cost.
		Rs.	Rs.
Elephant	4	44,880	1,79,520
Camel	6	39,504	2,37,024
Mule	20	82,800	16,56,000
Mule Cart	5	49,788	2,48,940
Bullock Cart	13	35,280	4,58,640
Total Annual Cost .	...	...	27,80,124
Add— Pay of British Officers per annum (*vide* Table F) . .			4,98,900
Add— Miscellaneous charges (renewal of gear, animals, pensions, travelling allowance)			10,00,000
GRAND TOTAL ANNUAL COST OF TRANSPORT CORPS .			42,79,024

IMPROVEMENTS IN THE PRESENT ORGANIZATION OF TRANSPORT IN INDIA.

By Major H. Bond, Assistant Commissary General.

Motto : "*Semper paratus.*"

PART I.

The Principal Features of the Present Organization.

Mobilization scheme.—It will not be necessary for the purposes of this essay to enter into the history of Military Transport in India prior to the last Afghan War. Those interested in the subject will find abundant food for reflection in the accounts of the various campaigns which have been undertaken since our first occupation of the country. The same story is repeated *ad infinitum*—delay in the collection of transport, bad selection of animals, poor feeding, want of proper supervision, cruelty and neglect, resulting in enormous losses. Affairs reached a climax in the campaign of 1878-80, when the appalling mortality amongst animals, and the consequent breakdown of the transport service, brought home to the Government the necessity of making provision to secure efficiency in this branch of the army. In 1882 sanction was accorded to the trial of a scheme proposed by Colonel (now Sir Robert) Low for the maintenance of a transport service in India, in connection with the general mobilization scheme, which was taken in hand at the same time.

Sir Robert Low's scheme.—Sir Robert Low's scheme provided for a mobilization reserve of transport, distributed, during peace time, in transport depôts throughout the country; the training of officers and men in transport duties; the registration of carriage; and for a permanent staff, separate from the Commissariat Department for the supervision, management, and administration of transport. The scheme continued in operation till 1887, when it gave place to the present system, by which a combined Commissariat-Transport Department deals with all matters connected with supply and transport. The scheme may have been, in some respects, unsuited to the conditions of service in India, but it must be acknowledged that it effected the main purpose for which it was designed—*viz.*, the establishment of the nucleus of a permanent transport service. Moreover, it embodied the chief points of the organization which must be adopted for Indian transport; and proved of the greatest value, at a crucial time, in bringing prominently to the notice of the military authorities the particular features of an organized transport service for this country.

Peace organization.—In the present organization of transport, Army Transport is divided into two heads—

(*a*) Depôt Transport, maintained for general army service.

(*b*) Regimental Transport, kept in charge of regiments.

The Commissary General-in-Chief, assisted by a Commissary General for Transport, is primarily responsible to Government for its administration. The transport allotted to the several commands is administered by the Commissaries General of these commands in peace time. The transport, both depôt and regimental, allotted to each district, is under the direct control of General Officers Commanding, as regards its utilization for duty or service, assisted by Chief Commissariat Officers of Districts. For the general efficiency of depôt transport, Chief Commissariat Officers are responsible; they are assisted by officers of the Commissariat-Transport Department, and by a staff of European subordinates, native agents, and salutries. Officers Commanding Corps are primarily responsible for the efficiency of regimental transport; they are assisted by a Regimental Transport Officer and a small staff of transport assistants. Regimental Transport Officers hold the same relative position to transport in regimental charge as departmental officers do to depôt transport. Chief Commissariat Officers, as staff officers for transport, have also supervision over transport in regimental charge, and Officers Commanding Corps are required to afford them every facility in carrying out inspections of such transport.

War organization.—A similar system is adhered to in time of war, the Commissary General in the field being responsible for the general administration of the transport under the orders of the General Officer Commanding. The distinction between regimental and depôt (*i.e.*, general) transport is maintained, and provision is made for expanding the reserve transport kept up in peace, by purchasing and hiring as circumstances may dictate. The transport is under the General Officer in all respects; the senior departmental officer is his staff officer for supply and transport; the control and administration of both branches are centred in one individual, but the separation of the executive working and supervision of supply and transport duties is distinct.

Remarks on organization.—Such is the organization of the Transport service, which has been accepted by the Government, after many years of careful deliberation and practical experience, as being best suited to military requirements in India. It provides for the mobility and autonomy of corps units, which are of vital importance for the work our troops are called on to do, by equipping them with regimental transport; and vests the control of general transport in the department which is responsible for the maintenance of supplies for the army. Although these points, which are acknowledged to be of the utmost importance in a scheme for military transport, are attained, the organization has not been accepted with universal approval.

Objections to system.—It is not within the scope of this essay to discuss the merits of the "Silladar" or "Transport Corps" schemes for transport which have been proposed, or the relative advantages of an organization separate from the Commissariat-Transport Department, which has had a protracted trial in peace and war. But it has been urged that the regimental system of transport is impracticable on field service, and that the duties in connection with supply are so heavy that the management of transport on lines of communications cannot be carried out by the combined department. With due deference to the opinion of experts who hold these views and whose experience entitles them to respect, it may be pointed out that it has not yet been proved by practical experience, which alone is a safe test in such cases, that the regimental system in its integrity cannot be adhered to under the conditions of field service. It may, it probably always will be necessary to employ regimental transport to assist the general transport, or for other work; but if under such circumstances the regimental organization is retained, as it is intended that it should be, and it is fully understood that the regimental transport is always to be available for its legitimate work, there does not appear to be any insuperable objection to temporary transfers being made. Furthermore, with regard to the allegation that the Commissariat-Transport Department is not in a position to manage its own transport, it appears to be overlooked that the systematic organization of supply duties in the field has decreased the work of that Department so materially that there is no reason why it should not now undertake all the duties which devolve on it. If the principle on which corps units are equipped with transport is accepted for one branch of the army, it should, *a fortiori*, be applied universally, in which case the control of general transport would rest with supply officers.

Departmental control.—The suitability of departmental control for military transport is also a vexed question that must be noticed. It may at once be admitted that the tendency of all systems of departmental administration is towards over-centralization of authority and a conservatism with regard to expenditure which is not conducive to improvement. There is also reason to fear that practical efficiency is often subordinated to mere office work. But, on the other hand, the Commissariat-Transport Department has great resources, and possesses in itself the machinery for rapid expansion. It holds the position of one of the largest disbursing agencies for Government, and this is all in its favour when the strain of war has to be met. It is, in its every-day transactions, brought closely into touch with the civil authorities on whose assistance we must rely, to procure animals and attendants, on the outbreak of war. A separate agency for the control of transport has been tried, but did not prove as successful as was anticipated; and it is more than doubtful whether further attempts in this direction would result in a more economical and suitable system of control than the existing one.

Peace complement.—The transport now maintained in India as a peace complement and the amount available for equipping a force in the field is as follows (*vide* paragraph 529, Field Service Departmental Code, Commissariat-Transport, India) :—

						ARMY TRANSPORT CARTS.			
	Pack mules.	Draught mules.	Pack ponies.	Pack bullocks.	Draught bullocks.	Mule.	Bullock.	Siege train bullocks.	Camels.
Total complement .	14,095	2,650	743	50	3,086	1,518	3,798	3,060	800
Deduct as per detail under paragraph 529, Field Service Departmental Code .	4,239	56	743	350	432	28	316	...	700
Balance available, less unfits found at the time. . . .	9,856	2,594	...	...	2,654	1,490	3,482	3,060	100

In addition to the above, 2,317 hired camels are maintained in the Bengal and Panjab Commands for general army service, but, under the terms of the contract deeds, are not available for field service.

Native Cavalry mules.—Included in this reserve are the Government mules substituted for one-third of the grass-cutters' ponies of Silladar Cavalry regiments. These mules are attached to regiments at the scale of 87 per unit, and amount to 3,416 mules, which with their drivers can be withdrawn for field service. A valuable reserve of well-organized transport is thus provided, but unfortunately is limited in quantity and cannot be increased without interfering with the Silladar organization of native cavalry regiments.

Imperial Service Transport.—Corps of Imperial Service Transport have been raised during recent years in Native States. The Jeypur and Gwalior cart trains, numbering in all about 1,000 carts, fitted for double pony draught, were employed throughout the Chitral campaign. These cart trains are organized under British officers, and in point of efficiency compare most favourably with our best transport. Their organization, equipment, and general management are all that can be desired.

Transport with Civil Departments.—The utilization of army transport with Civil Departments in time of peace has long been under the consideration of Government, as a means of forming a reserve which would be available in time of war. Proposals have been made to employ carts with municipalities, and in the Survey, Public Works, and other departments, and the scheme has been given a limited trial. Undoubtedly, these proposals, if they can be carried into effect, will provide economical employment for transport in peace time. But it will be difficult to create any general demand for transport which must be hired out on the specific condition of being returned when wanted, and which can only be maintained at a cost larger than that of ordinary contract carriage.

Increase of Reserve.—The question of increasing the present peace complement of transport is one of great importance. The maintenance of a reserve is governed by the consideration of cost, and it would be obviously inexpedient to augment our reserve transport unless remunerative employment can be found for it. Ordinary duties in stations, water duties in the hills, the movement of troops and grass-farm work, now furnish employment for the mules and bullocks that are kept up; but these duties are limited; and no means have yet been discovered by which Government transport can be profitably utilized, to any large extent, in time of peace. The desirability of increasing our mule and bullock transport, which now only amounts to approximately the requirements of two divisions at war strength, with a small reserve for general transport, cannot be denied, but it would be difficult to find employment for a greater number. The same objection operates against the formation of Camel Corps, of which class of transport we stand urgently in need on mobilization, as the cost of keeping them unemployed in peace time would be prohibitive. The easiest solution of the whole transport question is the maintenance of reserves of Government transport, sufficient for all requirements; but the burdened state of the finances of the country and the special classes of animals required put this beyond the bounds of possibility. The reserve of transport must refore depend on the amount of the grants for military expenditure, and there is nothing to be done but to strive to perfect the material we have at hand in peace time with a view to its rapid and efficient expansion in time of war.

Description of animals.—Owing to this limited reserve it becomes necessary, on military operations being undertaken, to hire or purchase the descriptions of animals which are suited for Army Transport. The transport resources of the districts contiguous to the theatre of operations, and the nature of the country, will, in a great measure, determine the transport to be employed. It will consist of wheeled transport, camels, mules, ponies, pack bullocks, and donkeys, as may be most readily available. Wheeled transport is, of course, used whenever possible. Camels, which are undoubtedly the best pack transport for military purposes, are employed for the carriage of the first reserve of supplies, and on the outer lines of communication. Mules can be used anywhere, and are always useful. Pack bullocks and donkeys are suited for employment on inner lines of communication for the carriage of commissariat stores. Ponies are used for pack purposes generally, and for the conveyance of sick.

Collection of carriage.—The civil officers of districts alone can give such information as will enable carriage to be purchased or hired, and their co-operation, in whatever system may be adopted for expanding the reserve, is always essential. The usual means which are employed are—

(*a*) the collection of transport through chowdries;
(*b*) hiring by contract;
(*c*) hiring or purchasing animals direct from owners;
(*d*) impressment.

Collection through Chowdries.—The collection of transport has, from time immemorial in India, been effected through the medium of chowdries, or influential men, who know the whereabouts of carriage. When the amount required is limited, this method, which is suitable to the country, is generally found effective, but for large demands the machinery is apt to fail. The system is, moreover, liable to grave abuses, and cases are not rare in which chowdries have accumulated large fortunes at the expense of the State and the real owners of carriage. It is unpopular with the civil authorities, and is unsuited to modern conditions, which demand rapid mobilization.

Contract carriage.—Contracts for carriage are of two kinds. A formal contract may be entered into for the carriage of stores from the base of operations, or the carriage of the country may be employed to convey stores between supply depôts at fixed rates. Anything in the form of a legal contract is totally unsuited to the conditions of field service. Such contracts are inelastic, and in the event of lines of communications being changed, fresh contracts have to be made. This system has, moreover, all the disadvantages of the chowdry system, as the contractor only works for his own profit. A most salutary rule exists with regard to supply for a force in the field, that contract is never to be resorted to beyond the base, and the same prohibition should be extended to contract carriage of this kind. These objections, however, do not apply to the hiring of carriage at maundage rates in districts adjoining the lines of communications, which forms an appreciable addition to the general transport. Its employment, moreover, is often desirable from political motives. No formal agreement is necessary, and the carriage is paid for in ready money at the end of the journey.

Purchase or hire direct.—The purchase or hire of animals direct by Government, on mobilization being ordered, is carried out by a special staff of officers, who, under the orders laid down in the Field Service Departmental Code, are deputed to the various carriage-producing districts, and with the assistance of the civil officers buy up or hire the amount of transport required. The system has obvious advantages over any other, and in conjunction with impressment should, if prearranged and perfected, provide all the carriage that may be wanted.

Impressments.—Impressment is the means by which carriage always has been, and always must be, obtained when required in large quantities. In Europe the requisitioning of carriage in war is fully recognized and universally resorted to, and there is no apparent reason why, in India, when other means fail, carriage should not be obtained by impressment. The dislike that the native of India has to transport service with Europeans under any circumstances, and more particularly with troops, is well known, and it can only be got over in an emergency by seizing cattle. The idea is foreign to the character of our Government, but many who know the country well have expressed the opinion that very little hardship would be inflicted on the people if impressment is carefully regulated, and the contribution of each district is fixed beforehand.

Resources of transport.—The actual extent of our resources of transport in India is difficult to fix with accuracy in the absence of compulsory registration. In 1881, a return furnished to the Army Commission gave the carrying power available at a fortnight's notice as [illegible] maunds, and this was considered under the mark. The peace and prosperity of the past decade may be set off against any diminution of animals of the classes we require, due to the extension of communications, and it may be assumed that the resources of the country are fully equal to any demand we may have to make. Confirmation of this view is given by the statistics which have been collected by officers deputed to register the resources of the Panjab and trans-frontier districts, and the returns furnished by civil authorities of transport now available in Northern India, and in Native States.

Hire versus purchase.—The relative advantages of hiring or purchasing animals for a campaign is another much debated question in connection with Indian transport. On the one hand it is urged that animals in sufficient numbers will not be available for hire; that transport, the property of Government, is more mobile and easy to manage; that although purchase adds to the first cost, it proves a measure of ultimate economy; that animals can only be hired for active service at very high rates; and that claims for compensation in case of loss, which is often deliberately caused, are heavy. On the other, it is claimed that the advantages of hired transport in charge of owners, who know the wants of their animals, and all the details of feeding, loading, and fitting saddlery, more than counterbalance the mobility of Government transport; and that the defects inseparable from newly-purchased transport—*i.e.*, want of organization, new and consequently ill-fitting gear and untrained attendants—neutralize any superiority it may have. The Government of India in a Military Department letter, No. 572-D. of 29th March 1893, summed up the controversy, and recorded their opinion that Government transport should be used, as far as possible, on the outer lines of communication and with troops, and that hired transport should be reserved for employment in the vicinity of the base.

Disadvantages of newly-purchased transport.—But this point, on which the efficiency of our mobilized transport so much depends, cannot be disposed of in this way, by the mere publication of an order. There are numerous considerations involved in it. It is possible to organize, equip and work mules, ponies or draught bullocks, because we have practical experience with these classes of animals, and can obtain the services of attendants who, under European supervision, can be taught their duties. Even then, however, efficiency is not attained in a day, and loss and ill-treatment of animals cannot be avoided. But every campaign in India, from the first Afghan War of 1838-40 to the Chitral Relief Expedition, shows conclusively that it is beyond our powers to organize, with even a semblance of efficiency, the descriptions of animals which are worked exclusively by natives. We have repeatedly purchased camels, pack bullocks and donkeys, and have always failed in their management owing to want of knowledge of their requirements, unsuitable and badly-fitting gear, and incompetent attendants; and we cannot hope for success until we are in a position to purchase animals with the gear in which they are accustomed to work, and to secure competent attendants of the proper classes in place of the recruits now hurriedly enlisted in the bazars of our large towns. The only possible way to do this is by the registration of transport animals and attendants.

Registration.—Since Sir Donald Stewart laid down the principle that "rapid and simple expansibility is vital to the whole question (of transport)," the necessity for the registration of transport has been recognized, but the opposition to the introduction of this most essential measure has prevented its adoption. It was one of the distinctive features of Sir Robert Low's transport scheme, but, unfortunately, owing to the paucity of his staff, no systematic registration of carriage appears to have been undertaken. On the reversion of transport duties to the Commissariat-Transport Department, the matter remained in abeyance. The existing machinery for expanding the transport sufficed for the requirements of the small frontier expeditions in which we became engaged. Periodical enumerations of cattle in the Panjab and trans-frontier districts served to indicate the whereabouts of the transport in the country, and it was collected by the usual means.

Necessity for registration.—The apathy which has been shown with regard to the registration of carriage is undoubtedly due to the attitude of the Government, which, in a most important letter on transport to which reference has previously been made, considered that "rather than attempt to introduce a costly system for registration and retaining fees, which, after all, may prove inoperative, it will be better to trust to the ordinary action of demand and supply, believing that the transport required for army purposes, if available in a district, will be always forthcoming in time of war, provided that fairly liberal rates are offered."

These words were written when it was not realized that modern mobilization would require the concentration of the large number of animals which represent the carriage of a division of all arms, at a given point, in a limited space of time, and cannot be held to apply to present conditions. Our failure, in the recent mobilization, to collect the necessary number of animals in the time at our disposal, leaves no room for doubt that more effectual means are necessary to keep pace with the times, and that it is a most unwise policy to trust implicitly to the resources of the country.

PART II.

REGISTRATION AND EXPANSION OF TRANSPORT IN TIME OF WAR.

Transport on mobilization.—On mobilization, the transport for a division of all arms, equipped with normal transport, *i.e.*, pack mules, mule carts, and camels, is—

		MULE CARTS.		BULLOCK CARTS.		
Pack mules.	Camels.	Departmental mules.	Carts.	Departmental bullocks.	Tongas.	Carts.
3,008	4,867	748	340	938	215	210

including 1,438 camels for the carriage of commissariat supplies and two days' grain which accompany each corps unit in the field. Of the above numbers the pack mules, draught mules and bullocks are available from the reserve, but provision will have to be made for the 4,867 camels, of which no reserve is kept up.

First reserve.—Carriage must at the same time be arranged for a first reserve of food supplies and grain to accompany the force. The weight of daily food supplies and grain, exclusive of fodder, may be taken at 2,200 maunds, so that 20 days' supplies would amount to 44,000 maunds or 9,000 camels—allowing spare, etc., say 10,000.

In other words, we will have to mobilize at the base, in the same time that troops are mobilized, 3,756 mules and 938 bullocks which are available from the reserve, and 15,000 camels which will have to be collected in the country.

General transport.—Concurrently with these arrangements provision will have to be made for the carriage required on the lines of communication, the amount varying according to circumstances. The constitution of the force, the nature of the operations on which it is engaged, the season of the year, the resources of the theatre of operations, are all factors which have to be taken into consideration. For expeditions on the North-West Frontier extending over a long line of communications, we are justified in assuming, from the experience of the last Afghan War and the recent Chitral Expedition, that a carrying power of not less than two lakhs of maunds will be required for a division. Allowing for equipment carriage, and that arranged for the first reserve of supplies, which are included in this total, a carrying power of from 1,00,000 to 1,20,000 maunds will remain to be placed on the lines of communication as soon as practicable after the mobilization of the force. This transport will consist of wheeled transport as far as possible, but all descriptions of pack animals will be employed where roads are not suitable to carts.

Concentration.—The concentration of 20,000 animals at the base during the time the troops are being mobilized, and the collection and despatch of a supplementary force, representing over one lakh of maunds for general transport, when the railway is still occupied in forwarding supplies for the front, is the weakest point in the scheme of mobilization. The figures given refer only to the transport required for a single division, and the difficulties will increase in proportion to the size of the force mobilized. Errors of principle cannot be rectified in the field during the strain of active operations, and unless we can equip troops with regimental transport before they leave the base, our scheme of organization may be abandoned. In the Chitral mobilization we completely failed to collect the requisite transport in the time allowed, and the three brigades which marched from Nowshera on the 28th March could only take some 4,000 mules and 3,000 camels when their full equipment required treble these numbers. In consequence of this deficiency the plan of military operations was interfered with, and confusion caused in the transport which was never afterwards rectified. It is true that within a few days of the departure of the force a plethora of transport was poured on to the lines of communications, but it was then too late. The mischief had been done.

Defects in scheme for concentration.—The inability to collect transport in the time at our disposal is distinctly traceable to a weak railway system and inadequate arrangements for expanding the transport. It is to be feared that our frontier railways with a single line of rail and limited rolling-stock will always find difficulty in coping with the strain of mobilization, and it must, consequently, be our endeavour to lighten their work as much as possible. The existing machinery for the expansion of transport has shown itself capable of collecting very large numbers of animals if time is allowed. The statistics of the second phase of the Afghan War show that 18,000 animals were hired or purchased in a comparatively short period, and, during the Chitral Expedition, 45,000 animals passed through the base in six weeks, some 10,000 of which were, however, the Government reserve. The mobilization scheme requires that transport shall be available in a limited period, and it is only necessary to improve our arrangements for collecting and concentrating carriage to meet this requirement. We have sufficient data to work on, as, in any future campaigns on the North-West Frontier, the base of operations and the general lines of communications, with the force that will be employed, are, for all practical purposes, known, and the transport, the bulk of which is available in Northern India, can be approximately estimated. It then rests with us to re-organize our collecting agency in such a way that organized bodies of transport may be concentrated without delay at convenient centres, not necessarily head-quarter stations, on receipt of orders for mobilization, whence they can be railed or marched to their destination.

Scheme for mobilization.—This would require the compulsory and permanent registration in peace time of transport and transport attendants by a staff of military officers, assisted by a subordinate staff of natives of the country, working in conjunction with the civil officials; and with their approval and sanction fixing the contribution of each district, tehsil, and village in proportion to its resources. A scheme of this nature, which involves a departure from old-established methods, would, presumably, require special legislation authorizing registration and impressment when necessary. It is in no way original and varies but little from the proposals put forward by Sir Robert Low in 1882. This scheme has been suggested as feasible by civil officers of experience. The main points to be attended to in its elaboration are alluded to in "A scheme for Ensuring a Proper Supply of Carriage on hire in cases of Emergency" proposed by Captain J. B. Hutchinson in 1881.

Details of scheme.—The proposed scheme involves—

(*a*) The preparation of working schemes for transport for one, two or more divisions on known lines of communications, to determine the quantity and description of carriage required for forces of different strengths, with a view to the proportionate assessment of districts.

(*b*) The legalization of registration of carriage and of the classes dealing with wheeled or pack transport, and of impressment when necessary; with stringent penalties for the evasion of the law.

(*c*) The selection of officers with a knowledge of the country and language, assisted by a staff of natives, preferably native officers of regiments, or men of influence in the districts in which employed for registration duty.

(*d*) The staff to be attached to the Commissariat-Transport Department and their relations to the Department and civil authorities to be clearly and distinctly defined. The staff to be separate from any hiring or purchasing staff which may be employed on mobilization.

(*e*) Appointments to carry staff pay, plus travelling allowances for all ranks, and to be in the nature of travelling appointments, each member of the staff being in camp for a specified portion of the year.

(*f*) Primary registration by civil authorities of all carriage in the country, without registration fee.

(*g*) Subsequent registration by the Registration Staff of animals and attendants in order to eliminate the cattle of special classes who may be exempted from the operation of the Act, unfits, etc., and to secure only animals and attendants that are fit for service.

(*h*) Periodical inspection of selected transport.

(*i*) Maintenance of registers for each class of transport to be hired or purchased showing name of village, result of civil registration, assessment, names of owners or attendants to accompany transport to the field, and the revision of these registers at periodical inspections.

(*j*) The compilation of statistics from these registers at head-quarters of districts, and their periodical transmission to Commissaries General through Commissioners of Divisions.

(*k*) Separate assessments in proportion to the quantity of transport required for forces of different strengths, in order to regulate the demands of Commissaries General on each district. Assessments to be renewed after specified periods.

(*l*) Arrangements for collecting registered transport at convenient centres, in corps of suitable strength.

(*m*) Organization of supervising staff to at once take over district contributions of carriage, at collecting centres, on mobilization being ordered, and to be responsible for them in the field.

(*n*) Despatch of corps of transport from collecting stations by rail or road, as may be most convenient, to the base.

(*o*) Liberal rates of hire to be fixed beforehand, and made known generally, which should be exclusive of any deductions on account of rations for men or animals, and unfitness of animals, unless wilfully caused. Liberal compensation at a fixed rate for each animal, without reference to period employed, to be granted if the animal dies from causes beyond the owner's control. In case of purchased transport, liberal rates of pay to drivers enlisting voluntarily or impressed.

Advantages of scheme.—These are only a few of the more important points in connection with the scheme, the details of which can be elaborated at leisure. It may be claimed for it that it would make known to the people, in time of peace, their obligations to the State in time of war, and would afford them the opportunity of making their arrangements beforehand to meet these obligations, and that it would be generally understood that on failure to fulfil them impressment would be resorted to. Like all other new schemes, difficulties have to be overcome; and it would require to be introduced with caution, and with the full co-operation of the civil authorities. But the memory of *begar* or forced labour, to which the people of India were accustomed under their own rulers, has not yet died out; and when all is said the scheme is but a return to old methods under new conditions. It appears to hold out the promise of securing the rapid and efficient expansion of transport, at a moderate cost, and in conformity with the requirements of the present day. Its trial on a limited scale, in the first instance, would involve a comparatively small cost.

Registration of camels.—In connection with this scheme the registration of camels would require separate attention, and possibly a modification of the general rules. Bullocks, mules, and donkeys are more or less stationary in villages throughout the country, and on an emergency can be rapidly collected if proper arragements are made. But the camel-owner of the Panjab and trans-frontier districts, from which practically the whole of our camel transport will be drawn, is a nomadic being, and during certain seasons of the year roams far a field conveying produce from one district to another. An officer (Major Mansel, 3rd Panjab Cavalry), who was recently employed on special transport duty in the districts of the North-West Frontier, states that although enumeration (*i.e.*, compulsory registration) is feasible in the cis-frontier districts, it would be impossible to carry it out among the trans-border clans. He also considers, as the result of enquiries made from frontier officials, that border carriage cannot be either bought or hired in any large quantities without some form of impressment being resorted to by the district officers. This opinion of an officer who had special opportunities of obtaining good information, taken in conjunction with that of many experienced district officers who have been consulted on the subject, restricts the feasibility of registration to the more settled districts, but suggests the means by which camels can be most readily obtained.

Subsidies.—The subsidizing of owners of carriage, with a view to command their services in time of war, was suggested by Sir R. Low, and his proposals were thoroughly threshed out by the Government of the Panjab, to whom they were submitted for investigation. Ultimately they were rejected as involving a heavy annual charge without any certainty of adequate results. The opinion of many district officials was, however, that the system was feasible though expensive. The whole question of expansion of transport is primarily one of expense, and in view of the large sums which are annually spent on mobilization it seems highly desirable that this proposal should be given a trial, more especially as our present arrangements have been proved to be inadequate for the rapid collection of transport. It would be unwise to involve ourselves too deeply at first in an experiment of this nature; but an attempt might be made, in the first instance, to secure, through the registering staff, a first reserve of 15,000 camels in the settled districts of the Panjab by compulsory registration, aided by a small retaining fee for each animal selected as fit for service. In the trans-frontier districts, where registration is manifestly impossible, it would perhaps be preferable to set aside a certain sum annually for subsidizing camel-owners or headmen, in proportion to the number of animals they possess, and would bring forward, under certain specific conditions, in time of war. Even if the results were not entirely satisfactory, the money spent would not be wasted, as it would bring our officers into direct touch with a class of men who have at present every reason to regard us with distrust.

Popularizing the service.—Whatever may be done with regard to registration, action is urgently needed to popularize the transport service, and to associate the possession of carriage with the thought of liability to the State in time of war. This can best be done by making known the conditions of service; by removing the restrictions which tend to make service with troops so distasteful to owners of all descriptions of transport, to organize all hired transport into compact workable divisions, with a supervising staff to look after their pay, rations, clothing, etc., and generally to safeguard the interests of the owners of carriage. We must do away altogether with the fatal deductions of pay, which are not understood and cause great discontent, and fix liberal rates to cover the risks and hardships of field service, which should be paid regularly, and in full, to the men by their own officers. Compensation must be allowed on a fair scale, without deductions, for all animals which die from causes outside their owners' control. Nothing can be more detrimental to the true interests of the service than rules which authorize arbitrary deductions from pay for grain and fodder which have probably never been drawn, or allow compensation to be assessed by officers who may never have seen the animal which died. If the unpopularity which now attaches to Government transport service is ever to be removed, we must cast away the traditions of a bygone past, and, recognizing modern conditions, endeavour by fair, liberal, and common-sense treatment, to prove to owners that service under Government is not entirely devoid of advantages.

PART III.

ORGANIZATION AND MANAGEMENT OF TRANSPORT IN THE FIELD.

Supply duties.—The organization of supply duties in the field has received most careful attention, and detailed instructions are given in the Departmental Code defining the scope of the work that may be anticipated, and the best methods of carrying it out. The subdivisions of lines of communications into sections, each with its head-quarters at a supply depôt, which is analogous to a Chief Commissariat Office in peace, the relations of depôts to brigades and stages, the provisions of establishments and equipment, the maintenance of supplies, and, in brief, every important detail which a Commissariat Officer may have to deal with, is fully explained. The same trouble, however, has not been taken with the chapter on transport, which, although containing much useful information, is merely a collection of disconnected notes strung together on no fixed plan. The chapter gives no explanation of the nature of the work that may be expected, and some of the most important points in connection with transport in the field are reserved for the appendices. Many orders that are impracticable on service still find a place in its pages, and altogether the instructions are complicated and badly arranged. It is the opinion of many officers of experience that a complete revision is required to make the chapter of real use to the officers who are responsible for transport. Some of the more serious omissions and errors may conveniently be indicated here.

Control.—In peace time, the department is accustomed to the supreme control of the senior departmental officer, and this is apparently the system that is intended for service; but the orders referring to this point are complicated and difficult to understand. If departmental control is contemplated, the organization to which the department is accustomed should be adopted in all respects. The titles "Divisional Transport Officer," "Base Transport Officer," etc., are useful designations; but it must be distinctly understood that these appointments do not carry independent administrative, as distinguished from executive, control. This may appear a small matter, but a great deal of the confusion and excessive correspondence which distinguished our first attempt at mobilization was attributable to the misunderstanding which prevailed regarding the control of the transport.

Regimental transport.—No section in the chapter requires remodelling more than the one on "transport in regimental charge." The fundamental principle of our present organization is the distinction between regimental and general transport, and the assistance to the general scheme which may be anticipated by placing the former on a sound footing is not inconsiderable. Regulations for regimental transport are scattered over the chapter, but this is not what is wanted. An officer in charge of regimental transport must have at hand a concise set of rules to serve as a general guide in cases with which he usually has to deal, and these rules should be separate, and in addition to the rules for general transport. It should serve as a regimental officer's *vade mecum* in all matters relating to regimental transport, and embody the fullest information regarding the expansion of transport on mobilization, and the procedure connected therewith, general care and management of animals and attendants in all its branches, rules for the employment of regimental transport as general transport, and all similar points.

General transport.—The organization of general transport into compact, manageable bodies, is one of the essential features of the proposed scheme for registration. Every campaign in which we have been engaged in India has conclusively demonstrated the impossibility of efficiently working unorganized masses of transport on lines of communications; and that if organization into workable divisions is not taken in hand at collecting stations or at the base, it has subsequently to be carried out under the adverse conditions of field service. If further testimony is required on this point, the experience of the Chitral campaign abundantly provides it. Our regulations, however, are silent on this most important subject, and merely state, in a general way, that the charge of hired transport will not carry the usual allowances which are sanctioned for the charge of Government transport.

Nature of work.—From a transport point of view, our frontier campaigns may be considered under three heads:—

(*a*) Punitive expeditions in which a force advances rapidly on an objective, and retires after inflicting punishment.

(*b*) When the military occupation of a district is contemplated, and no resistance being expected, the lines of communications are considered safe.

(*c*) When a military force advances on a distant objective, with the possibility of protracted operations in a hostile country—*e.g.*, the Afghan and Chitral campaigns.

The first case represents the most elementary form of transport administration in the field. Regimental transport is provided for the equipment of the troops, and the general transport is employed on the "through convoy" system, to maintain food supplies in touch with the column as it advances. Cases (*b*) and (*c*), however, furnish intricate problems, under varying conditions, in the handling of masses of transport, and the disintegration of the "through convoy" system, adopted to feed an advancing force, into the "staging" system, which must necessarily be resorted to when military operations are likely to be protracted. To effect this smoothly and without friction when active operations are proceeding is a severe test of the administration and organization of the transport, as the change must be carried out in such a way that the reserve of food supplies in the advanced depôts is not unduly depleted.

Distribution of responsibility.—The simplest way of doing this is, of course, after completion of the reserve in the advanced depôt in touch with the force, to break up the lines of communication into suitable sections, subdivided into stages, to which transport is allotted. With the large number of animals that are employed on a long line of communications, it is obvious that these arrangements cannot be carried out by a single individual, but require a chain of responsibility to be imposed, apportioning the duties of the respective grades. The officer in charge of the general administration can form a knowledge of the route, and of military requirements, indicate a general plan of operations for the guidance of those serving under him, and he can allot transport for each section. But he must depend on his subordinate officers for its further distribution to stages, the stocking of supplies at those stages, the provision of equipment, the general supervision of work, and the innumerable details in connection with the every-day routine.

Keystone of administration.—The division of the lines of communication, on a carefully-prepared plan, and the consequent distribution of responsibility, is the keystone of transport administration in the field. The advantages of a pre-arranged working scheme are seen in the case of supply, which furnishes a suitable foundation on which to construct an improved organization for transport, without involving any radical change of system. It is absurd to suppose, as is apparently done at present, that transport will work of itself, or that an officer, with the inadequate staff now allowed, is capable of controlling the 40,000 animals and the large number of attendants that accompany a division in the field. Organization is essential, and the most convenient and suitable lines on which to carry it out appear to be the assimilation wherever practicable of the system in the field to that to which the department is accustomed in peace. The requisite machinery is afforded by the institution of Commissariat-Transport charges on the lines of communications, similar in their main features to Chief Commissariat ranges in time of peace, under the administrative control of the senior departmental officer, but with separate staffs for the working of supply and transport. There is no apparent reason why this should not be provided, and clearly explained in our regulations for field service.

Staging system.—It may be accepted that the staging system to which allusion has been made will be universally adopted in future campaigns for forwarding supplies to the front. This system appears perfectly simple, but is in reality difficult to work, especially with new transport, and satisfactory results depend entirely on a thorough knowledge of the *modus operandi* and careful management. It is no exaggeration to state that there is not a transport officer in the country who is competent to regulate the working of this system, who has not gained his practical knowledge at the cost of repeated mistakes. It is essentially a subject which should be explained in a code designed for field service, but it is disposed of in a few lines in our regulations, which only serve to convey an entirely erroneous impression regarding the method of using transport under these conditions.

Revision of Code.—A criticism of the Departmental Code is beyond the scope of this article, and it is unnecessary to pursue the subject further than is necessary to indicate the nature of the revision which is required. If the main principles are attended to, the elimination of minor errors—*e.g.*, the mode of obtaining money for transport requirements, the method of paying followers in the field, the relation of commissariat to transport with regard to stores in transit, etc., etc.—will follow as a matter of course.

Necessity for revision.—It may be said that the conditions under which transport is employed on service will not admit of regulations for all cases, and that it is unwise to attach too much importance to the codification of rules. It must be acknowledged that there is some truth in these objections, and that no compendium of rules will ever serve as an efficient substitute for the qualities which we know under the term "administrative ability." But we see in every department of the army that an intelligent effort to draw up rules for mobilization has resulted in a diminution of work, and a simplification of system, by which the worst evils of departmental control are avoided. These books of reference have proved an invaluable aid to officers of all grades, in bringing to notice important points which require attention, and indicating the ordinary routine on service. Valuable experience in mobilization has recently been gained, which will facilitate the task of placing our admittedly defective transport service on a better footing; and this experience cannot be utilized in a better way than in remodelling the general instructions for service, and impressing on all concerned the vital importance of organization and distribution of work.

PART IV.

THE SUPPLY OF OFFICERS AND SUBORDINATES TRAINED IN TRANSPORT DUTIES.

Complement in peace.—The sanctioned complement of supervising establishment for the Commissariat-Transport Department in India is—

Administrative Officers	6
Special Duty Officers	8
Executive Officers	116
Honorary Commissioned Officers	17
Warrant Officers	119
Non-Commissioned Officers	201

Complement in war.—The supervising establishment allowed by the present regulations for a division of all arms on service is—

	SUPPLY.					TRANSPORT.				
	DEPARTMENTAL.			REGIMENTAL.		DEPARTMENTAL.			REGIMENTAL.	
	Commissioned Officers.	Honorary Commissioned and Warrant Officers.	Non-Commissioned Officers.	Officers.	Non-Commissioned Officers.	Commissioned Officers.	Honorary Commissioned and Warrant Officers.	Non-Commissioned Officers.	Officers.	Non-Commissioned Officers.
Division of all arms . .	6	3	23	6	...	1	1	2	6	16
One 1st class Base Depôt .	6	14	...	...	16	1	4	...	4	2
Three 2nd class Advanced Depôts . . .	6	15	...	...	24	1	3	...	2	3
Intermediate stages, say 11 .	...	...	10	...	...	...	...	10	...	...
	18	32	33	6	40	3	8	12	12	21

Revised complement.—The allotment for transport is manifestly inadequate. Without entering into details, the following distribution is approximately what would be required for the proper supervision of the transport of a division in the field :—

	TRANSPORT.				
	DEPARTMENTAL.			REGIMENTAL.	
	Commissioned Officers.	Honorary Commissioned and Warrant Officers.	Non-Commissioned Officers.	Officers.	Non-Commissioned Officers.
Division of all arms	2	1	2	6	6
One 1st class Base Depôt . . .	2	3	3	...	...
Three 2nd class Advance Depôts . .	3	3	3	3	3
For 60 Transport Corps of, say, 500 each	..	...	...	60	60
	7	7	8	69	69

—exclusive of staff for transport in regimental charge.

The total complement for supply and transport duties would then be for one division—

Departmental Officers	25
Honorary Commissioned and Warrant Officers . . .	39
Non-Commissioned Officers	41
Regimental Officers	75
Regimental Non-Commissioned Officers.	109

Paucity of Officers.—A comparison of these figures will indicate the strain to which the Department is subjected on the mobilization of a single division, one-fourth of the available officers and subordinates being required for service. It is impossible to deplete Commissariat ranges in India of the whole of their permanent staff, for not only has necessary work to be carried on, but food supplies and equipment for the army in the field are provided through their agency. It becomes necessary, therefore, to expand the Department, and this expansion is facilitated and made feasible by the substitution of a simple procedure on active service for the cumbrous departmental system which is adhered to in peace, thereby enabling regimental officers and non-commissioned officers to be taught in peace the duties that they will have to perform in war. This method of expansion is the only one, consistent with economy, which can be adopted. In the event of the mobilization of two or more divisions, we should be dependent almost entirely on this supplementary staff for the supervision of transport in the field, and the proper training of officers and men is consequently a matter of great importance.

Training of Permanent Staff.—Before discussing the subject, it is necessary to refer to the insufficient attention that is paid to the education of the permanent staff in field duties. The departmental regulations for peace and war are, in many respects, entirely opposed to each other; and the conditions of the Department are such that an officer may serve for years in peace without having occasion to refer to the Field Departmental Code. A certain number of the permanent staff certainly acquire a practical knowledge of field service duties in the numerous expeditions which periodically take place, but this opportunity of self-instruction is not afforded to the majority; and, practically, no steps are taken to ensure that officers and subordinates possess even a theoretical knowledge of the duties in which, at a moment's notice, they may have to instruct others. If training schools are established, all grades of the departmental staff should undergo a course of training before joining the Department; but in any case an examination in departmental duties on field service should be made compulsory for all officers and subordinates at the end of their year of probation.

Reserve of Officers and Men.—The means resorted to for obtaining a reserve of transport officers and assistants for the charge of regimental transport during peace, and for transport duties in the field, is to detail annually one British officer and four non-commissioned officers or men from each cavalry and infantry corps for a course of training at the transport depôt of the district. The training is limited to a course of six weeks' duration, and is confined exclusively to the elementary routine of transport work in peace, the conditions of field service being altogether omitted. There is no defined method of instruction, and the procedure varies in every district. Even the packing and loading drill, which, it would be thought, does not admit of great variations, is different in different places. The course is unpopular with commissariat officers, with whose work it interferes, and is regarded by the army at large as a "loaf."

Defects of the course.—This cheap experiment of making Chief Commissariat Officers responsible for the transport training of the army in addition to their ordinary work has been under trial for several years, and the results are anything but satisfactory. The minor defects of the course can, perhaps, be rectified, but no amount of tinkering will ever make the training what is required; for it will hardly admit of discussion that a short course conducted under such conditions will never prove a suitable school for the instruction of the supplementary staff in the many and varied duties they will have to perform on service. The issue involved is a simple one. Are we to spend money on a separate educational establishment where a thorough preparation can be given to young officers in transport work generally; or are they, as at present, to be sent into the field, knowing next to nothing of their duties, to acquire experience at the cost of mistakes which may cause confusion at a critical time, or even the paralysis of the mobility of the army? If efficiency is the chief consideration there can be only one reply.

Central Training Schools.—The institution of central training schools similar to the schools of garrison instruction and musketry will, for the four commands, necessitate an increase in the permanent staff of the Department of four officers and four warrant officers. The selection of the instruction staff would require great care, and appointments should be tenable for a fixed period. The gift of imparting knowledge is not given to all, and when officers and subordinates show aptitude for it, solid inducements should be offered them to undertake this special class of work, and to make the appointments as much sought after as those on the Musketry or Instruction staff. This staff, in addition to instruction work, could be attached to the offices of the Commissaries General of Commands to compile statistics of transport in connection with the registration scheme, and to make systematic inspections of depôt and regimental transport in the command.

System of Training.—The duration of the course should be extended to, at least, two months—a period none too long for what has to be done; the training, as at present, should be carried out at large transport depôts, in accordance with a carefully-prepared syllabus. The curriculum should include the present course as laid down in Captain Wickham's "Military Transport," supplemented by an authorized drill for packing and loading. Section XII of India Army Regulations, Volume V, will have to be referred to in connection with the rules for the care of depôt and regimental transport in peace; but the main object of the course should be to explain the main features of the organization for supply and transport on service, as laid down in the Departmental Code and the Field Service Equipment Tables. On the termination of the course the knowledge of the class should be tested by an independent board of military officers.

Further suggestions.—The regulation which requires candidates for transport certificates to accompany a regiment on the line of march might, with advantage, be cancelled. The composition and strength of classes should remain as at present, a maximum of 32 being as many as can be conveniently instructed at one time. Three or four classes, as may be decided, would be held in the year, which would ensure some 350 to 450 officers and men being put through the course annually in India. The allowances now granted for the charge of transport should be reserved exclusively for officers and men who have passed the course. Regimental transport should be confined to packing and loading. Classes for the instruction of officers and men of the Native Army should be held once a year at each centre, and should, as far as possible, be conducted on the same general lines as for Europeans, with a view to qualify native officers and men for the charge of hired transport on service, for which they are specially fitted, and for which they will in all probability be largely employed in future campaigns.

Status of Regimental Officers.—The status of regimental officers employed on departmental duty on service requires consideration. At present an officer is attached to the Department, but is not of it. He is entitled to the staff salary of the lowest commission grade, without reference to his army rank, or to the appointment he may be holding, and only in very exceptional cases is this rule modified. He is junior in departmental rank to the latest-joined subaltern of the permanent list. His chances of personal distinction are less than with a regiment, and altogether his position is anomalous and unsatisfactory. It is unwise to rely entirely on the spirit of enterprise which animates all young officers to volunteer for active service; and if we wish to make the service popular, and to attract the best men, some more substantial inducement than now exists must be offered. In the reorganization of transport duties which must, sooner or later, be taken in hand, it may be anticipated that the sphere of action of the regimental transport officer will be considerably enlarged, and that when a large force is put into the field many of the higher departmental appointments will necessarily be filled by officers of the temporary staff; and in such cases the grading of incumbents and the staff salary attached to the appointments ought to be commensurate with their importance. A convenient way of improving the status of attached officers would be the grant of grade rank according to the appointment held, and to place them, when employed in the Department, on the same footing, in all respects, as the officers of the permanent staff.

Departmental grading.—This concession is in accordance with the system of purely departmental administration which exists, and is desirable in other respects. If depôts and stages on the lines of communications are administered by senior departmental officers, there must be some recognized channel for the transmission of orders and the transaction of business, and the most convenient channel is the senior officer at the stage. This senior officer will usually be a regimental officer whose position brings him into daily contact with the subordinate supply establishment of the post over which he has, at present, no control. By granting him grade rank, and recognizing him as the responsible officer in ordinary matters, his position will be materially strengthened without imposing any appreciable increase of work. It will not be necessary to infringe on the line of demarcation which separates transport and supply work, nor to overburden the officer with excessive clerical labour. The proposal as a matter of fact amounts only to the official recognition of what an officer in this position has to do now in an illegitimate way. It is not intended to hamper an officer with supply accounts, for instance; but all departmental matters demanding executive action might well be transmitted through the stage officer, in order that he may be acquainted with what is going on, and be in a position to see orders carried out.

Uniformity of system.—The interests of the supply and transport branches are so intimately connected on service that every endeavour should be made to avoid their dissociation more than is absolutely necessary for separate working. Occasions are constantly occurring where a stage officer may have to take up supply work, or he may at any time be able to render valuable assistance in the collection of local supplies. In such cases a general knowledge of the system of supply will be of great importance, and it is for this reason that the inclusion of this subject in the course of study is considered desirable. It seems a very unwise policy to suggest to attached officers that they are in no way connected with the Department, and that they belong to a branch which has separate duties and separate interests, when work will be facilitated, and discipline, so necessary on field service, will be promoted, by mutual co-operation. One necessary step towards this is the recognition of the departmental status of all officers temporarily attached to the Department for duty.

PART V.

THE SUPPLY OF ATTENDANTS.

Difficulty in obtaining attendants.—Caste and the conservatism peculiar to India prevent the application of European methods for the supply of attendants for transport animals. We cannot, as in England, enlist and train transport service companies for the care and management of all the descriptions of carriage with which they may have to deal. In a country where the tending of particular animals is an hereditary calling, a special class of attendant has to be provided for each description of transport animal. This unfortunate restriction has always constituted a serious impediment to the efficiency of our transport service, as, on the outbreak of war, we have experienced great difficulty in getting suitable attendants, and have had to resort to indiscriminate enlistment, regardless of the qualifications of the men for the work for which they are required.

Classes of attendants.—In dealing with the supply of attendants we have to provide for—

(*a*) The normal establishment in peace, and the formation of a reserve for purchased animals.

(*b*) The method of recruiting on a sudden expansion of transport, to secure properly-qualified attendants for each description of animal.

No hard-and-fast rule can be laid down to regulate the hire or purchase of animals required on expansion. With a good system of registration, it will probably be found convenient to hire, as far as possible, those classes of animals which are used as beasts of burden by the natives—*viz.*, camels, pack bullocks, and donkeys—and to purchase only mules and ponies, in the management of which we have experience.

Peace complement.—The normal establishment of attendants consists, for the most part, of muleteers and bullock-drivers, who rank as followers. They are organized in accordance with the system in force in the Department. A great deal has been done of recent years to improve the conditions of service, and the force is, on the whole, very fairly efficient. It does its work at, probably, the minimum of cost to the State, and there is no difficulty experienced in maintaining its ranks at full strength by voluntary enlistments. Various schemes have, from time to time, been brought forward to improve the organization of the force by assimilating the terms of service to those of our Native Army; all of which, more or less, involve a change of system, and the substitution of military for departmental control. These proposals have been rejected by Government, as, in view of the impossibility of forming an efficient fighting force out of the heterogeneous material of which the transport establishment is composed, it is more than doubtful whether the advantages gained by such an extreme measure would compensate for the extra cost of maintenance. A few minor reforms may be suggested, which can be carried out in the Department itself without extra cost, and which will tend to popularize the service.

Improvements.—There is, perhaps, no military privilege which is more highly prized by the native than the grant of an annual furlough on full pay. This concession has to be denied to the transport follower owing to the constant work which falls on Government transport in peace, and the limited number of the establishment. The constant transfers which take place owing to which men are involved in heavy expenses on account of their families is another legitimate grievance which causes many useful trained men to take their discharge. The organization of transport depôts on a territorial basis, as now exists in the Native Army, would supply the remedy for these grievances, and while providing a local field for recruiting, would, at the same time, ensure fixity of abode for the families of a class of men who are constantly on the move. By this arrangement the applications for furlough would be considerably diminished, and it would be possible to grant a small percentage under special circumstances. The re-organization would be carried out departmentally without extra cost.

Supervision.—The weak point in this branch of the service, and which is characteristic of the whole transport system in peace, is the undue prominence which is given to office work, which occupies the greater portion of the time of the staff, and interferes with that constant personal supervision on the part of officers and European subordinates which is essential for military transport as for any other organized military body. The only hope for improvement in this respect lies in a judicious revision of the peace regulations, based more especially on the requirements of field service, which would do much towards reducing the numerous forms and returns that are now required; and the systematic inspection of depôt and regimental transport by selected staff officers for transport. It seems strange why, with separate branches to deal with all matters connected with supply and accounts, no effort is made to simplify procedure in the transport branch, and to establish a more effective system of practical supervision and control, which, in time of war, is all-important.

Reserve.—A reserve of muleteers is furnished by the attendants of the mules which are maintained in lieu of one-third of the grass-cutters' ponies with Silladar Cavalry regiments. This reserve will vary according to the number of cavalry regiments mobilized. In the event of a regiment being mobilized only 25 of the muleteers become available for duty in the transport, whereas, if the regiment is not mobilized the whole of the 87 muleteers allotted to it are given up for duty in the field. We cannot, therefore, estimate exactly the extent of the reserve that will be available on mobilization; but, under ordinary circumstances, it will amount to some 2,000 men in the four commands, sufficient to equip at the sanctioned scale 4,000 to 5,000 transport mules or ponies, which, in all probability, will have to be purchased when a division is mobilized.

Increase of reserve.—A reserve of bullock-drivers is not required, as this class of attendant can always be obtained on the outbreak of war. The reserve of muleteers cannot be increased without incurring considerable expense. An "active reserve," modelled on the lines of the Indian Army reserve, is unsuitable for a transport reserve, an essential feature of which is that thoroughly-trained men must be held ready to proceed on service at a moment's notice. The only alternative method is to increase the peace establishment of drivers to the extent for which money may be provided, and thus to create a reserve of attendants for a second division if mobilized. The maintenance of muleteers and native supervising establishment for 4,000 animals would cost about Rs. 1,75,000, and this would be an annual recurring charge. Undoubtedly a reserve in excess of the 10 per cent. spare which is now allowed for normal casualties is desirable; but it rests with Government to decide whether funds can be allotted for this purpose, or whether, in view of the expenditure which is urgently needed in other directions, the expansion of the muleteer reserve must be deferred for the present.

Hired transport.—A reserve of muleteers will, however, be of no assistance in equipping the camels, pack bullocks, and donkeys which will be hired or purchased in the event of the expansion of transport; and the method to be adopted to secure competent attendants of the required classes forms an integral part of the scheme for registration of carriage. With regard to hired animals, even in the absence of any arrangements, a fairly good class of attendant, who generally has a pecuniary interest in his animals, is obtained. With a sound system of registration, owners will naturally arrange for attendants for the animals for which they are liable, and the names of such attendants will be registered when the animals are selected; any alterations in the register which may become necessary being promptly notified to the transport registering officer. In exceptional cases—as for instance, when a village community is assessed at a certain number of animals, the property of different owners—the selection of attendants might be entrusted to a panchayet of owners. It would be necessary to let it be known that the registration was not an empty form, and that, if selected attendants absconded, impressment on the village concerned would be resorted to.

Purchased transport.—Greater difficulties are to be anticipated in the case of carriage which it may be decided to purchase, the attendants for which will have to be compulsorily registered in the districts in which the animals are to be bought, and from the classes accustomed to the particular description of animal, or, in other words, for every animal selected for purchase a competent attendant will also be registered. It is doubtful whether the offer of a gratuity would facilitate enrolment, or ensure the attendance of registered men at the appointed time, but on this point, as on the numerous details of the scheme, civil officers of districts alone are in a position to give a definite opinion. What seems most to be needed is that legislation should be taken in hand on the lines of proportionate assessment, and with a view to minimize the hardships which it is to be feared are inseparable from the scheme, and that the Military Department should provide a suitable organization, to look after men during the period of their employment, and frame general rules which will allow officers immediately responsible for their management to deal equitably and liberally with the men in their charge.

PART VI.

FINANCIAL ASPECT OF PROPOSALS.

The approximate cost involved by the proposals made are, as far as the Department is concerned, shown below. It is assumed that existing civil establishments are sufficient to carry out the primary registration of transport.

Registration Scheme.

Complement of registering officers and agents—

Panjab	2 Officers	19 Agents.
Bengal	1 Officer	8 ,,
Bombay	1 ,,	6 ,,
Madras	1 ,,	4 ,,
Native States. Panjab Bombay Central India	3 Officers	12 ,,
Total	8 Officers	49 Agents.

	Rs.
8 Officers @ Rs. 300 per mensem plus travelling allowance @ Rs. 150 for six months plus deputation allowance @ Rs. 150 for six months =	43,200
49 Agents @ Rs. 50 per mensem plus fixed travelling allowance @ Rs. 25 per mensem =	44,100
Total	87,300

1st Reserve of 15,000 Camels from Districts in the Panjab.

	Rs.
Retaining fee @ 12 annas per mensem per camel	1,35,000
Subsidy to camel-owners of trans-frontier clans, a lump sum for distribution of	50,000
Total	1,85,000
GRAND TOTAL	2,72,300
Say	3,00,000

Instruction Staff.

	Rs.
4 Departmental Officers @ Rs. 425 per mensem	20,400
4 Warrant Officers @ Rs. 160 ,,	7,680
Contingent allowances, rent, etc., @ Rs. 100 per mensem for each school	4,800
Total	32,880

In concluding this essay, it is only necessary to remark that the present transport organization, as sketched in our regulations, has not yet had a fair and impartial trial on service. In the recent Chitral Expedition its most vital principles were ignored. The primary equipment of corps units with regimental transport was not observed, and no systematic attempt was ever made to organize the general transport. As a remedy for the confusion which occurred in the early days of the expedition, the management of the transport was taken away from the Commissariat Department, and the organization which had been accepted by the highest authorities in the land was swept away to make place for a nondescript system, the most marked feature of which was an impracticable centralization of control.

The lesson to be learnt from the practical test to which the mobilization scheme was subjected is that the transport organization is still lamentably incomplete and behind the times ; and that the inadequacy of the arrangements for rapidly collecting transport is aggravated by serious defects in its management in the field. There is, however, nothing to show that the system is radically vicious, nor that it can more efficiently be replaced by any other. On the contrary, a careful analysis in the light of our experience furnishes strong presumptive evidence that the scheme possesses great possibilities, which, however, require a great deal more than the mere expenditure of money for their full development. It will be useless to spend large sums on registration and improving the machinery for expansion, unless we can ensure the working of the transport on a sound system after it has been collected. Consequently, in this essay, special attention has been given to the elaboration of the working scheme for transport ; to the nature of transport work, and the best methods of carrying it out ; and to the education of all grades of the Department in the duties of field service.

THE IMPROVEMENT OF THE PRESENT ORGANIZATION OF TRANSPORT IN INDIA.

By Captain M. Cowper, 10th Bengal Lancers.

Motto: *Tout vient à temps, à qui sait attendre.*

Introductory.

Ancient history.

Of the many considerations that affect warfare, especially modern warfare, no question is more complex or difficult to solve than that of transport. Reference to campaigns of byegone and remote ages abundantly testify that, although little or no regard was paid to the comfort or preservation of the lives of the hordes composing the armies of those days, still many of the conceptions and designs of some of the most famous generals the world has ever seen, failed from want of transport. Hannibal, Cæsar, and Alexander are all instances. History, dictated by the leader himself and thus handed down to posterity, records the victories, glosses over the defeats. It does not, as a rule, go into particulars, merely chronicling bald facts. We are told the road was difficult; the country extremely mountainous; the rivers broad and deep; a decisive victory was obtained; the legions suffered defeat. Statements, one and all, doubtless correct as far as their veracity is concerned. But the student of military history, reading between the lines, traces the disaster or failure, not necessarily always to faulty strategy or tactics, but to the great and vital principle of mobility, or, in other words, to transport, or rather to the want of it.

The Napoleonic era.

"War supports war." Such is supposed to be one of the *dicta* of that marvellous genius and past master in the art of war, Napoleon: and it may be safely asserted no man more thoroughly carried out this axiom. Yet we have only to turn to the annals of his campaigns to find that no general more fully recognized the necessity of adequate transport in the field, or of its preparation and organization in peace-time. His master mind grasped the fact that to strike rapidly and surely was the most certain road to victory. Mobility above all other considerations meant success; and he left no means untried to ensure mobility to the armies he led or directed. Doubtless it can be said that Napoleon is not a fair example upon which to base an argument. Endowed with what may be fairly called almost superhuman talents and discernment in all that pertained to warfare and its art; practically unlimited and boundless resources at his disposal, questions of transport to such a man would present no more difficulties than numerous other problems which he attempted to solve and accomplished. Still we have only to trace the events of his later campaigns, and we find that most of his defeats were due, not only to the deterioration and numerical inferiority of his armies, but also to the want of transport. From continual campaigning, losses in action, hardships and other causes, not only had the ranks been thinned of the veterans that once composed them, but, like all other integral parts of the military organization, the transport, or " train " as it was called, had suffered equally. No operation in warfare shines with greater lustre, or more fully exhibits the genius of Napoleon, than that of the campaign of the Loire in 1814. With the remnants of the once famous and invincible *Grande Armée*, supplemented by ill-trained and hastily-equipped levies, he faced the whole of the armed strength of Europe. For more than two months he held them at bay, inflicting defeat after defeat. Until at last the Allies, recognizing how hopeless it was to deal with such a man, violating all the accepted rules and traditions of warfare, abandoned their lines of communications, and marched on Paris regardless of all cost. Then, and not till then, Napoleon, beaten but not subdued, forsaken by the nation which, for a period of two decades, he had by his victories constituted the arbiter of the destinies of Europe, abdicated. Reference to his own memoirs, written while in captivity at St. Helena, and also to those of many of his best-known generals, since given to the world, all tend to show that astonishing as were the efforts made, and the results produced, still not the least of the various difficulties with which he was embarrassed, and with which he had to contend against, was that of want of transport.

To descend to even more modern times, the same story is repeated.

Franco-German War.

The lesson to be deduced from the Franco-German War of 1870 is not only that of one nation thoroughly ready in all respects conquering another equally ill-prepared for the struggle. The French, outnumbered and out-generalled from the first, badly led, harassed by divided councils, only fought to be defeated. Of the many explanations afforded as to their downfall, none is more pertinent than that of their utter and absolute want of transport. The gallant but unfortunate French soldier more often than otherwise had to fight half-starved and famished with hunger : if entrenching tools were required to strengthen a position, in the generality of cases they were not forthcoming : if a corps. was required to reach a certain locality in a given time, it generally failed to do so, or else arrived with half its complement of ammunition. These conditions were entirely due to the non-existence of adequate transport.

Russo-Turkish War, 1878.

Again, if we turn to the example of the Russo-Turkish War of 1878, we discover that the protracted period of the campaign is as much attributable to the want of transport on the part of the Russians, as to the stubbornness and intrepidity of the Turks. Once the Russians had crossed the Danube, their difficulties, from a transport point of view, commenced, as they lacked the means to move with the necessary rapidity the huge masses of which their armies were composed.

Skobeleff.

Skobeleff failed (though it is only correct to assume that there were other factors as well which contributed to his failure) principally from want of transport, in his first attempt to subdue the Turkomans. Biding his time, and profiting by the experience gained, his second expedition succeeded.

Necessity of adequate and efficient transport.

Were it necessary, dozens of similar instances, including operations in all parts of the world, civilized and uncivilized, could be cited. No force, no matter of what nationality or material composed, however well disciplined and equipped, even if led by the most competent of generals, can ever, with any certainty, even count upon the possibility of success, unless it possesses a sufficient and adequately prepared transport train. It is true that certain instances are recorded where successes have been obtained in violation of this principle. But in nearly every case the victors have been either semi-civilized or absolute savages, whose habits and customs, combined with an intimate knowledge of the country, have enabled them to prevail, where, under the same conditions, a civilized force must have undoubtedly suffered defeat.

Violation of this principle how explained.

Admitting, therefore, how important this problem is, the question of transport—that is, of transport, as composed of wheeled carriage or pack animals—varies very considerably in different parts of the world.

Condition in Europe.

In Europe, in the event of a continental struggle between any of the great Powers, the theatre of war can be located beforehand almost to a certainty. Central, Northern, and Southern Europe, with the exception of portions of Russia and Turkey, are densely populated, contain large and important cities and towns distant from each other but a few miles, every inch of the country being covered with a net-work of railways, and equally intersected with good military roads. Obviously such conditions simplify immensely the factors of transport. An invading force, even assuming that the enemy has destroyed as much as possible all railways, bridges, and roads situated on or near the assailants' line of advance, has always means at its disposal for their repair; and once in working order and under his control, the invader's chief cause of anxiety ceases. By the use of railways he can forward sufficient and regular supplies of food and material, if not direct to the most advanced fractions of his army, at least to some fairly advanced depôt or base, from whence it can be carried on by wheeled traffic. Again, owing to the populous nature of the country in which he is operating, both wheeled and pack carriage is usually abundant and generally only requires collection and impressment. The question of both housing the troops and of obtaining supplies of food and forage is, as a rule, easy of solution. The free use of billeting in the towns and villages provides for the former, and a recourse to requisitioning for the latter. Moreover, when operating against a civilized nation, in the case of a success, or even that of a defeat, the welfare and security of the wounded is assured.

Conditions in uncivilized countries.

But if we turn to military operations conducted against barbarous or semi-savage races in uncivilized and very often practically unknown countries, how utterly different are the conditions that have to be faced. Huge tracts of desert, devoid of water, or else narrow, rugged valleys, hemmed in or closed by insurmountable mountains or almost inaccessible passes. Regions sparsely populated, the natural supplies scanty and barely sufficient for the support of the inhabitants. The population bitterly hostile, and more often than not excited by religious hatred and never ceases. Though, as sometimes occurs, the troops themselves may have a comparatively comfortable and easy time of it, food and supplies, for both man and beast, have necessarily to be forthcoming when required; and thus the demand on transport never abates.

Material available.

Having thus enunciated, as far as possible, what constitutes the ideal, though, at the same time, necessary qualifications of a transport officer, it now only remains to consider the material available from which this class of officer can be drawn. Having settled this matter, it may then be feasible to formulate some reasonable suggestions as regards the course of training to be adopted. Under the existing organization of the Indian Army, the two separate branches of supply and transport are merged into one, known as the Commissariat-Transport Department. Therefore, both in peace and in war time, the officers of the department are very rightly looked upon as experts, equally as regards questions pertaining to transport, as well as those connected with supply. Whether in every particular case they are experts or the reverse does not very materially affect the point at issue. The daily routine of their work, year in and year out, not only in peace time, but more especially on service, must necessarily be conducive to the highest form of training possible. If failures do occur, in this case it is not due to the system, but rather to the individual. However, as the Commissariat-Transport Department, unlike most other cadres in the army, is based, as regards the number of its officers, more on the principle of a peace establishment than that of one of, if not quite, *the* most important units of the fighting machine, it naturally follows that whenever mobilization takes place, or even when a small insignificant expedition has to be despatched, it is obliged to indent on officers other than its own in order to fulfil the duties it is expected and required to perform. And it is with reference to the training of these officers, who are necessarily regimental, that the writer wishes to raise a few points and make some suggestion.

Importance of selection.

Before, however, dealing with the question of training, let us consider what undoubtedly appears to be the first, and, to a great extent, the most important factor in this particular case, namely, that of selection. In other words, before the training is attempted, no reasonable precautions should be left untried to obtain suitable material. The present system in vogue, if not radically wrong, certainly leaves much to be desired. Under existing regulations and rules, the following method of procedure is adopted. Annually General Officers Commanding Districts call upon Officers Commanding Corps in their districts to submit the names of officers desirous of undergoing a course of instruction in transport duties. Certain conditions as regards length of service are laid down and insisted upon, but nothing more. What in the generality of cases happens is, that volunteers are called for, and if not forthcoming, an officer *nolens volens* is detailed, and has to attend the class whether he wishes to or not. In either case, no attention is paid as to whether the officer or officers in question are in any way fitted by nature, character, or inclination to eventually become efficient transport officers; the argument apparently being that any man having gone through the course of training, as at present laid down by regulation, must of necessity become an expert in any and all matters relating to transport. The idea is as erroneous as it is unreasonable; and any of the numerous expeditions, which of late years have been despatched across the Indian frontier, signally prove this. It must not, for a moment, be understood from this statement that any attempt is made to decry the services of regimental transport officers as a body, when employed on service. But it would be equally incorrect and unsound to attempt to deny that in many instances officers have been sent on service in charge of transport, who, except that of having passed the prescribed course, possessed absolutely no qualification for the work they were expected to perform. What possible good can an officer be in charge of a transport stage, containing hundreds, possibly thousands, of animals, and their necessary attendants, or in charge of a convoy, who can neither speak nor understand correctly two words of the vernacular? What benefit is derived from a man being placed in authority over transport attendants who is cursed with an irascible and uncontrollable temper? Certainly very little advantage accrues to the State, and none at all to the unfortunate "drabi," who is powerless to protect himself from the thrashings he receives, except by deserting, which he generally does on the first opportunity. Can it reasonably be expected that a boy of three or four years service, who in the generality of cases in his regiment is entirely in the hands of his troop sergeant-major or colour sergeant, both on and off parade as regards the performance of his work, when pitchforked into situations of great responsibility, is likely to rise to the occasion? Or, again, take the case of a man who by nature, combined with the result of years of habit, imagines he is fulfilling his duty as a transport officer on service by sitting for the best part of the day in a draughty or possibly stifling office tent, and writing reams of foolscap concerning the advisability or not of his mules' tails being cut or their manes being hogged. And, as a last example, in the case of entertaining hired transport, or of purchasing animals outright, what possible utility can result from the deputation of officers for this duty who, in many cases, have never purchased a mule or pack pony in their lives, and who are ignorant of the points of a bullock, camel, or donkey? The answer to such a question is, first dire pecuniary loss to the State; and, secondly, a number of animals being sent to the front, whose presence with the force, instead of being a source of strength, resolves itself into one of weakness: not to speak of the amount of unnecessary annoyance and trouble which is entailed on all who may have the misfortune to be responsible for their working. These few instances cited are by no means imaginary; they are not only within the writer's knowledge, but within that of many others, and it is maintained with a certain amount of reason that they could, to a very great extent, be obviated, or at least guarded against in the future, if more care was exercised in the selection of officers prior to their being detailed for transport classes.

Remedy suggested.

The obvious remedy for these things is that the regulations should lay down definitely some more specific rules than at present exist as regards the qualifications of candidates whom it may be deemed necessary to train for transport duties: and that officers commanding corps should be held strictly responsible that any officers nominated by them possess, if not all, at least some of the requirements. As a guide as to what should be looked for in any candidate for a course of transport training, the following suggestions are submitted :—

Suggestions.

(*a*) A fair, if not sound, colloquial knowledge of the vernacular: this should by no means be gauged, as is generally the case, by a linguistic test, such as the Higher and Lower Standard in Hindustani. Many officers, especially in the British service in India, speak the language well and fluently, though they may never have had the inclination or time to pass either of the above examinations.

(*b*) A certain amount of knowledge, as regards the management and well-being of animals in large numbers, with reference to the accepted and recognized rules of feeding, watering and grooming, and also sanitation. Also, if possible, an acquaintance with the groundwork of veterinary principles.

(*c*) Sufficient service and experience, which would, generally speaking, entail an acquaintance with the written and unwritten customs of the service, thus enabling an officer to accept with a certain amount of self-reliance questions involving responsibility and judgment, which are bound to occur on service under any conditions, but more especially with reference to transport matters. The writer is of opinion that this requirement will, under ordinary circumstances, only be fulfilled by the nomination of either senior subalterns or junior captains.

(*d*) A taste for, and, if possible, a knowledge of, the points and value of horse-flesh. A man who is fond of, and understands, equine matters, is infinitely more likely to pick up and master with greater rapidity details and considerations affecting other classes of animals which in many respects are analogous to the horse, than one who possesses no such knowledge, and who by nature may be disinclined to ever study them. Whether this contention is correct or not, it is an indisputable fact that any officer deputed to either purchase or entertain hired transport, who has had previous experience in remount work, possesses from that reason alone an immense superiority over one who has not had a similar advantage.

(*e*) More attention should be paid than at present exists to the question of temper and the general suitability of the candidate as to the manner and way in which he performs his duties with his corps. And it stands to reason, all things being equal, that an officer who possesses the reputation in his regiment of being zealous, energetic, and painstaking, and who exercises his judgment and brains in executing whatever duty he may be called upon to perform, is certainly more likely to succeed in dealing with any work, although entirely new to him at the outset, than one who is, by temperament, slack, careless, and apathetic.

Arguments for and against selection.

The above are from the writer's point of view essential qualifications in candidates as regards their primary selection. On the other hand, it may be very fairly argued that it would amount to almost an impossibility to find all and every one of the above requirements in any one officer; and that if such were insisted upon very few men would ever be trained at all. This argument is doubtless incontrovertible as far as it goes; but the answer is that although it certainly might be unusual to expect all these desiderata in any one particular instance, still it would be equally unreasonable not to suppose that some of them may exist. And if two or three, or even only one out of the five, is present, then manifestly an advantage is gained. Again, it may be inferred from the foregoing suggestions that, taking into consideration the requirements as tabulated above, the selection of officers for transport work would resolve itself, as far as the army in India is concerned, into a very narrow groove; and that such a state of things would be prejudicial not only to officers in particular, but to the army in general. In other words, it might be understood that the selection would lie, generally speaking, with officers of the Indian Staff Corps, and especially with those of the mounted branch, to the exclusion of those in the British Service, and belonging to the other arm. This is neither what is meant nor intended, and it can be easily shown that such a theory is as fallacious as it is untenable. To commence with, take the question of fluency and knowledge of the vernacular. Undoubtedly officers of the Staff Corps, as a whole, have an advantage in this respect over those in the British Service in this country: and it is only natural this should be so. The only means by which they can instruct and communicate with their men is through the medium of the vernacular; consequently even the worst linguist is bound eventually to become fairly proficient. Although officers belonging to British corps do not possess similar advantages for acquiring Hindustani, Panjabi, or Pushtu, still it would be contrary to reason and false to imagine, for a moment, that a very fair majority among them are in any way less competent in this respect than their brother officers in the Indian Service. Again, as regards the general management and details connected with such animals as the mule, camel, and bullock, the fitting of saddlery, care of gear, etc., etc., it certainly would be more logical to expect that an officer of the mounted branch would be more of an adept in this respect than one belonging to an infantry corps. Certainly a cavalry officer has an advantage over an infantry one in this particular matter. But then arises the question not so much of the system, but of the individual. The former should produce an expert, but it does not by any means follow that the latter is one. Numbers of infantry officers who though in the actual performance of their professional duties with their own arms are never called upon to perform the work which service with the mounted branch entails, are just as well qualified in every way to take up and execute efficiently any work in connection with the supervision of transport animals as a cavalry or artillery officer is. Any man, no matter to what branch of the service he may belong, who keeps up a stud of polo ponies or pig-stickers, and who looks after them carefully, and turns them out well, has, as regards this point, little to earn from anyone.

Necessity of the raw material being suitable before the training is attempted.

The *pros* and *cons* of this matter have been entered into in considerable detail, in order to try and demonstrate that if the suggestion with reference to the qualifications desirable in an officer are somewhat exacting and perhaps difficult to find, they are by no means unattainable. And all that is necessary to guard against a repetition of the evil in future, is greater care in selection in the first instance. It is obviously unwise and the reverse of common sense to attempt to train a man in any particular work, unless reasonable precautions are observed beforehand to ensure as far as possible that the raw material is what is required. Having made sure of this point it is equally rational to anticipate, provided the method of training is sound, that the finished article will answer the expectation.

And now the question arises. Is the system at present in use as regards the instruction of officers and men suitable? The reply is, at least so far as the writer's opinion is concerned, emphatically in the negative.

Course of instruction as at present in use.

It therefore only remains to discover and ascertain the weak points, and, if possible, suggest remedies for their eradication. The course of instruction or training, as at present laid down, consists of a six weeks' course at a chief commissariat centre, supplemented afterwards by a fortnight's supervision of transport animals on the line of march with some corps. With the latter there is only this fault to be found, and that is, that the shortness of its duration precludes any great advantage being derived. But with the former the case is different. In nearly every instance the six weeks an officer spends at a commissariat centre, as regards teaching him his duties as a transport officer in the field, is a mere waste of time: a daily morning stroll round the transport lines, possibly not always under the guidance of a departmental warrant or non-commissioned officer,—the only animals in the depôt, from which he has to glean and pick up as best he can the principles of feeding, watering, grooming, and stable management, generally being Government mules and bullocks, which are usually in limited numbers. He may also, for a few hours once a month, see a few camels which the contractors have to bring in for muster. But as regards the characteristics and nature, the method and manner of dealing with and working such animals as the camel, pony, or pack bullock, that is entirely left to his imagination. Consequently, when he proceeds on service, and is thrown in contact with any of these latter class of animals, he is forced to evolve knowledge and experience out of his own inner consciousness. Before the completion of the six weeks he is further put through a hurried and sketchy course of packing and loading on animals the various descriptions of tents used in this country. The remainder of the time is occupied daily by studying, or attempting to study, regulations and data as laid down in the authorized text-books; containing a variety of information, some of which is doubtless useful and instructive, but a great deal of which is the reverse, and could with advantage be eliminated. Details such as the diagnosis and treatment of "chowrung," and other kindred diseases peculiar to the elephant, an animal rarely, if ever, used on service now, and very little in cantonments: a vast amount of information regarding the transport attendant, concerning issues of clothing, boots, belts, badges; intricate appendices containing items of equipment and gear. No doubt, it will be said all of this is absolutely necessary, and could not be omitted without impairing the general usefulness of the course. But it seems to be quite forgotten that any individual of ordinary intelligence can cram up a certain number of facts for examination purposes, and with equal rapidity entirely forget them. Moreover, on service, as elsewhere, an officer is always able to refer to the regulations, should his mind have become hazy or uncertain with regard to any administrative detail; and he possesses, or should possess, a departmental agent, whose particular duty lies in being conversant with any data of this description. But to continue. At the termination of the course, an examination is held, partly theoretical, partly practical; the former comprising a paper or papers containing questions from the text-book—all and any of which can be answered absolutely correctly after a week's previous study. The latter is usually confined to verbal questions in the lines as regards the fitting of saddlery, care of gear, packing and loading of loads. If the result of the examination is considered satisfactory by the officer in charge of the centre,—and it may be safely affirmed it invariably is so,—a report to this effect is made to Army Head-Quarters. In due course, the officer concerned receives a duly-signed certificate, informing him that he has qualified in transport duties, and that he is liable to be utilized as a transport officer on service.

The picture not overdrawn.

The picture thus delineated is by no means overdrawn, as heaps of officers, who have undergone the prescribed course and received the qualifying certificate, can testify; and it therefore only remains to attempt to make some suggestions with a view to rendering the existing system of instructions more practical and eventually more useful than it is at present. To this end the following alterations are suggested:—

Suggestions.

(*a*) That the course for officers, at any rate, should be extended from six weeks to six months, and that during that period, which should, if possible, be in the cold weather, every opportunity should be taken to detail officers under instruction, at the commissariat centre, to proceed with transport of any description, marching from or through the station with corps on relief.

(*b*) That officers, while undergoing the course, should be made to attend and devote more attention to the work in the lines of the depôt, thus enabling them to obtain a better insight into the details of stable management and sanitation, fitting and care of gear: less time being set aside to the mere book-work or theoretical portion of the work.

(*c*) That only one, possibly two, commissariat centres in each Army Command, which should be specially selected, should be detailed as schools of instruction; only those being chosen which possess large numbers of the various descriptions of animals used for transport purposes.

(*d*) That an officer of the Commissariat-Transport Department, selected principally for his knowledge and experience of transport work, should be deputed as an instructor to the class: and should be held personally responsible for the instruction given and the amount of work performed by the class. He should also be invested with the power to remand any officer to his corps who, while under instruction, may exhibit want of aptitude or zeal.

(e) At the completion of the course, in addition to the certificate of passing, each officer should be reported on in detail confidentially as regards his probable use as a transport officer at some later period; it being distinctly understood that unless the confidential report is a thoroughly satisfactory one, the mere possession of the certificate alone would not necessarily entail employment on service.

Other suggestions can be found.

Doubtless there are other suggestions and alterations which could be adduced with greater advantage by those whose experience and judgment is more mature than the writer's, but at the same time he feels confident that, if only the above were given a trial, some benefit would be gained over the present system. Much thought and attention has been given to this particular portion of the essay, because it seems of the highest importance that too much trouble cannot be paid to, firstly, the selection of suitable material in the rough; and secondly, a sound and practical system of instruction and training, by which means alone success can be obtained.

Training of subordinates.

Turning to the question of subordinates, the same difficulties which apply to officers do not necessarily present themselves, in so far that the officer, when employed in any capacity whatsoever, is essentially the fountain head and mouthpiece; the subordinate simply receiving and executing orders and assisting generally. There is no need to formulate suggestions with regard to the warrant and non-commissioned officers of the Commissariat-Transport Department, who it can be confidently asserted are, as at class, one of the most capable and reliable body of men in the Indian Army. Indeed, while on this topic, it will not be out of place to state that many a regimental transport officer's reputation has been saved on service by means of a departmental subordinate's exertions and advice.

Primary qualifications required in the subordinate.

As, however, regimental non-commissioned officers, like officers, have to be trained in order to meet the expansion of the Commissariat-Transport Department when mobilization occurs, it will be advisable to consider how this object may best be effected. The factor regarding the primary and permanent importance of selection does not, for the reason already given, apply with the same force as regards the choice of the subordinate. But what undoubtedly should be a *sine qua non* in the non-commissioned officer, as in the officer, is a fair colloquial knowledge of the language of the country. After that, general smartness and reliability; and, if possible, experience in the management and supervision of animals. Such a requirement and knowledge will naturally only be found, as a rule, among non-commissioned officers of the mounted branches of the service: and it is from the former class that the most likely men are obtainable. But on the principle that every rule is proved by the exception, it should not be inferred from these remarks that every non-commissioned officer, either British or Native, selected for instruction in transport work should, of necessity, be drawn from either cavalry or artillery. Numerous instances have occurred, and will occur, where non-commissioned officers of the infantry have proved themselves thoroughly suitable for selection. But at the same time the writer maintains that the primary qualification as regards subordinates is more likely to be found in the mounted branch than in the sister service.

Training recommended for subordinates.

The period of training suggested for subordinates might be made considerably shorter than that recommended in the case of officers; three months being ample. The course should consist of entirely practical instruction, such as daily work in the transport lines, and deputation with transport on the line of march. No theoretical knowledge should be expected; but an acquaintance with, and an ability to keep correctly, the various forms and documents required by the Transport Department, should be made obligatory. If these suggestions are ever acted upon and put into force it is more than probable that the regimental subordinate on service will be found a hundred-fold more useful than he is at present.

2. Supply of Attendants.

Supply of attendants dependent on question of expense.

The question of the supply of attendants seems apparently, from the writer's point of view, to resolve itself into merely one of expense. If the financial condition of the Indian Empire was otherwise than it is at the present moment, those responsible for its government could afford to treat with a light heart suggestions involving extra annual recurring expenditure.

Short-sighted policy in maintaining transport with no reserve of attendants.

But as it is beyond dispute that transport must be maintained, it cannot be a wise policy to withhold the means by which it can be made more efficient: the existing weak points remedied; thus ensuring greater reliance on its capabilities and less likelihood of ultimate collapse. The Government of India have for years past sanctioned large annual sums for the purchase of transport animals, but while recognizing the necessity of procuring and maintaining the animals themselves, the question of attendants has apparently been either overlooked or allowed to drop.

The Government transport attendant.

Little fault is to be found with the regular attested Government mule or bullock attendant. He is, as a class, reliable and hard-working when properly supervised and looked after. His pay in peace time is not munificent, and if it were possible to raise it, there is little doubt that a better class of men than at present exists would be attracted; thus enabling a greater selection as regards physique, the want of which undoubtedly is the main defect among this class of men.

Necessity of a reserve.

But it is not so much concerning the actual men at present serving in this capacity, as the absolute want of any reliable reserve of trained attendants, from which to obtain the material to meet the consequent expansion which occurs on mobilization, or even to replace casualties on service, to which the writer desires to draw attention. That such a reserve is a positive necessity, and that at present it is non-existent, are facts not to be gainsaid.

Illustration afforded by the late Chitral Relief Force.

As a proof of this statement, no better illustration can be afforded than that of the late Chitral Relief Force. In order to further supplement the thousands of transport animals Government had bought and hired which were poured across the Malakand in the early days of the expedition, it was deemed advisable to purchase outright a large number of camels, ponies, and donkeys. That a very large majority of these animals should never have been purchased in the first instance, without doubt had a great deal to do with their subsequent mortality and general breakdown. But the main cause of their ineffectiveness was chiefly attributable to the worthless and unsuitable class of men who were entertained as attendants for these animals. How this occurred is not difficult of explanation. The animals having been purchased, attendants were naturally required to take charge of them. Notices, accordingly, to this effect were issued at all the commissariat centres in Northern India; and the highways and byeways ransacked for men. By these means the actual number of attendants required was obtained. But of what description and class did they consist? The scum of the Indian bazars: low-caste Hindus, such as mehtars, chamars, dhobies, and the like: Mahomedan budmashes, and a certain percentage of Muzbi and Khatri Sikhs were hastily collected, placed in charge of the animals, and then despatched across the frontier. What then might easily have been foreseen occurred. The attendants, 90 per cent. of whom, it can safely be affirmed, had never in their lives before handled the animals they were entrusted with, neglected and ill-treated the unfortunate brutes committed to their charge, or else deserted on the first favourable opportunity. Officers and subordinates, whose duty it was to supervise these animals, were driven to their wits' end in the endeavour to work them: and the chief difficulty they had to contend with were the attendants, who were so inexperienced and unused to the work that they were frightened of their animals, and unequal to the task of even loading them properly. Eventually, in the case of the camels, the attendants among the hired transport had to be indented upon and a considerable number of these men drafted among the so-called Government sarwans, to instruct them in their duties, and by this means the animals were worked in a kind of way, but never satisfactorily.

Deductions to be derived from the foregoing.

The deduction to be drawn from these facts clearly resolves itself into two headings: first, a very serious and unnecessary loss to the State, both as regards the question of the mortality and also of the expense of the up-keep of a large number of animals, which had to be fed at almost a ruinous cost across the frontier, and which in return did little or no work. Secondly, active service is no proper or suitable place in which to train either combatants or non-combatants. A corps which in peace time is considered inefficient and wanting in discipline or training is to a surety not selected to proceed on service. Why then should transport attendants be apparently the only exception to this rule?

Same difficulties likely to occur again.

This trouble might be met by the formation of a reserve of trained attendants, on similar lines adopted for the infantry of the Native Army. Of course such a proposal would entail a very considerable annual recurring expenditure. But would any reasonable person demur to the necessity of such expenditure? Surely not. It therefore only remains to attempt to sketch roughly some scheme by which the present difficulty may be avoided in future.

The following proposals are accordingly submitted :—

Proposals.

(*a*) That, as a commencement, 20 per cent. of the mule, bullock, and camel attendants at present in the Government service, who have over ten years' service, and who are considered medically fit for further employment, should be at once transferred to the reserve; their places being filled by new men being entertained.

(*b*) That annually all Government transport attendants over six years' service should be allowed, up to a margin of 10 per cent., to enter the reserve.

Assuming roughly that there are on the Government rolls at present 18,500 mules, 7,500 siege train and A. S. bullocks, about 2,500 camels, and that the attendants, in the case of mules and camels, are in the proportion of 1 to every 3 animals, and as regards bullocks, 1 to 2, this gives approximately a total of—

Camel attendants	833
Mule ditto	6,166
Bullock ditto	3,757
Total	10,756

By deducting 20 per cent. from the total, this gives 2,150 attendants as a nucleus for the formation of a reserve: by again deducting 10 per cent. from the above total, which amounts to 1,075, representing the number of men that would be transferred to the reserve annually after the first year: upon the assumption that every attendant is, as regards bodily requirements, able to perform his duties up to twenty years' service, *i.e.*, six years with his animals and fourteen years in the reserve, this would produce in

5 years 2,150 × 1,075 × 4 = 6,450 attendants.
10 years 2,150 × 1,075 × 9 = 7,525 ditto.
16 years 1,075 × 15 = 16,125 ditto.

Supervising establishment to be drafted into the reserve.

These calculations do not include any provision for a corresponding proportion of the transport establishment, such as duffadars and jemadars, being drafted into the the reserve as well as the attendants. This is, of course, equally important, but as the establishment in proportion to the attendants is so small in number, and as there would be no difference as regards the pay of the two classes while in the reserve, the same percentage as regards the supervising establishment would be observed.

The incidence of cost of this proposal will be found under the heading devoted to that subject.

Question of cost.

3. MOST ECONOMICAL EMPLOYMENT OF TRANSPORT IN PEACE TIME.

Difficulty of dealing with the subject.

This subject opens up so large and varied a field of discussion, that were it not for the absolute necessity of practicability, which is the essence of the whole matter, dozens of proposals might be advanced, all of which on paper might appear theoretically possible, but in practice the reverse of feasible. It is a matter, moreover, which for many years past has occupied the serious attention of the military authorities of this country. Although some attempts have already been made to institute measures with a view to effect economy in this respect, still it may be safely contended that not only has the problem not been solved in its entirety, but that a great deal more remains to be accomplished before it can at all be considered as satisfactorily dismissed. On the principle, however, that no difficulty can ever be overcome by its avoidance, and in the hopes that some of the ideas and suggestions now recorded may, in the eyes of those qualified to judge, possess some value—no matter how small—the following proposals are put forward:—

Increasing the number of Government grass mules with Native Cavalry Regiments.

(*a*) Already an attempt in this direction has been made by handing over to native cavalry regiments 87 Government mules, which in peace time are entirely fed and tended under regimental arrangements, thus saving the State the cost of their up-keep. On mobilization, these animals revert—if the expression may be used for want of a better one—to Government, as far as the cost of their maintenance is concerned. Primarily the intention was that they should only be used when the corps to which they were attached was mobilized and proceeded on service; the idea being that they would accompany it, and be available as extra regimental transport, carrying hospital appliances, reserve ammunition, etc., etc. But necessity, as in the case of the late Chitral expedition, may render compulsory their use for general hospital purposes; and as apparently no great hardship was inflicted on the regiments from which they were temporarily withdrawn, there seems no reason why not only should this course be pursued again, but that their number should be still further augmented. By increasing the number of mules already loaned to native cavalry regiments, a still further saving could be effected in peace time, and at the same time, as will hereafter be shown, these animals would always be available for general transport work; whereas the present complement, if the regiment to which they are attached is itself mobilized, are required regimentally, and cannot well on service be detached. What is now proposed is this:—Every native cavalry regiment proceeding on service has to leave behind at the depôt a certain percentage of its strength amounting under existing regulations to about 120 men and horses. In all Silladar Cavalry regiments, every two sowars, on the peace establishment, have to maintain between them one baggage animal. The depôt as regards this particular is established on a peace footing. If, therefore, the existing 87 mules were increased by 60 more—this being the authorized amount required at the depôt—these latter animals would always be, on mobilization, available for general transport: as whether the corps itself proceeded on service or not, it would not affect these surplus 60 mules. The State would, of course, as has already been done in the case of the late expedition, have to compensate the men at the regimental depôt for the temporary loss of their baggage animals, by supplying each man with grass gratis in the place of his mule.

Number of Government mules that could be provided for under the proposal.

There are in the Panjab, Bengal, and Bombay commands—Madras is not taken into consideration, as the native cavalry corps in that command are on a different footing—33 Silladar Cavalry regiments. It is therefore feasible, by the following simple calculation, $33 \times 60 = 1,980$, to show that this number of mules can in peace time be maintained without any expense to Government, and at the same time are always available when required. No doubt this scheme will not be viewed with any great favour by Silladar Native Cavalry corps generally; and if, on mobilization, every depôt was denuded of these 60 mules, it might, to a certain extent, prove a source of inconvenience. Though, excluding these animals, there must always be a certain proportion of excess grass-cutters' ponies left behind at the depôt; in so far as no native cavalry corps, under the present mobilization rules, can possibly take on service all its peace establishment baggage animals, therefore a certain proportion have to be left behind, and these could be used for depôt purposes. But as long as the State compensates the sowar, no real hardship would be inflicted.

Project for direct local purchase of supplies and carriage of same by Government transport.

(*b*) All grain for animals, and food for native troops, both of which are essentially products of the country, are in the case of all military centres in India brought into cantonments from the surrounding districts by means of contractors or bunias, both of whom make their own arrangements as regards carriage. It seems not only practical but feasible to employ almost an unlimited amount of Government transport for this purpose. The plan suggested is as follows:—

In the first instance officers of the Commissariat Department, especially selected for knowledge of supply questions, would be deputed to proceed into the districts adjacent to each military cantonment and there purchase locally in bulk, direct from the producers, whatever quantity of grain or food that might be required for the use of the troops, both man and horse, cantoned in the neighbouring station. All purchases then made would be conveyed on Government transport animals. By this method there would result a double gain; firstly, by dealing directly with the producer and thus avoiding the profits of the middleman or contractor; secondly, the saving on the cost of carriage, which, under existing circumstances, the contractor naturally allows for when tendering for a contract. One of the objections, the writer believes, which may be urged against this proposal, is that direct local purchasing of supplies by the Commissariat has already been tried, and failed. If such is correct, there then must be some good reason for the failure, and an equally possible remedy. It is a fact beyond dispute that one of the largest mercantile firms in the Eastern trade, through the medium of their European representatives in this country, annually purchase direct from the cultivator thousands upon thousands of maunds of wheat and other grains, which are exported to Europe; the result being extremely handsome, if not enormous, profits. What, therefore, private enterprise can accomplish, 'is surely possible for a Government, supported by all its authority and resources. On the assumption that such a system is feasible, provided it is properly worked out, the double gain—namely, the difference between the district and cantonment prices on the articles purchased combined with the saving effected by the use of free carriage—would in the writer's estimation very nearly, if not entirely, compensate for the expenditure incurred by the maintenance of the transport animals used for this purpose. The class of animal especially recommended, in preference to any other, for this particular work, is the camel, as it would be only necessary, when actually working, to give the usual grain ration; when not in work, all that would be required would be ample grazing.

Military Works and Public Works Department to take up and work Government transport.

(c) There seem good grounds for supposing that the Military Works Department could in the execution of their work utilize more Government carriage than at present is the case. This suggestion is made, not so much with reference to the conveyance of Government stores, which are generally transported by means of State carriage, but more with regard to materials, such as bricks, stones, kunkar, earth, which are required and used in the construction of houses, bridges, culverts, metalling of roads, and erection of embankments, etc., etc., and most of which are carried, when necessary, by the contractor, who takes the contract for their supply. It is, therefore, reasonable to imagine that contracts for such work could be considerably lowered if the department undertook to supply carriage, and thus considerable saving to the State might be effected. This proposal applies equally, but with even greater force, to the Public Works Department, inasmuch as the continuous and heavy nature of the work, such as the construction of railways and canals, and their maintenance when open, which devolves on the latter, far exceeds, as a rule, anything the former may be called upon to perform. Doubtless, in both instances, the suggestion of the use of Government carriage, which would, to a certainty, interfere with the existing system of contracts, will lead to departmental opposition. Be that as it may, it is no good or valid reason why the experiment should not be tried.

More use of Government transport in cantonments.

(*d*) In a great many cantonments in India, Government transport is to a certain extent used in connection with work under the control and jurisdiction of Cantonment Magistrates. But this, the writer thinks, could be greatly increased, and with advantage both as regards cantonments in general, and with economy to the State. Government bullocks could be used more extensively for the removal of night-soil, and for other purposes relating to sanitation. Wells in public gardens and in other localities under cantonment supervision could be worked by either bullocks, mules, or ponies. During the hot season watering carts could be, if adopted, drawn by ponies or mules. In all such cases, the hire of the animal used would be met from the cantonment funds: by this means the State would be the gainer by the transaction.

Transport suitable for use in municipalities.

(*e*) Either adjacent to, or in the near vicinity of, most military stations, large native towns or cities are usually situated. One and all, under the present Local Board régime, possess Municipal Committees, who are responsible for the sanitation and other matters connected with the well-being of their respective charges. The same suggestion as regards the employment of Government transport in cantonments is equally applicable in the case of municipalities.

District officers to use Government transport.

(*f*) District officers of all classes and grades should, while touring in their districts or circles, be ordered to employ Government carriage, instead of hiring private transport. They should be required to pay for it or else have the amount deducted from their monthly travelling allowance bills.

Government transport camel trains.

(*g*) In certain frontier districts, notably that of Baluchistan, which depends almost entirely on the Panjab and Sindh for the supply of grain required to feed horses, mules, bullocks, and the like, and also food for the native population, a large amount of Government carriage could be most profitably employed. The establishment of a camel train, with such an object in view, would not only be perfectly feasible, but, if worked on proper lines, would become a source of profit.

Native Cavalry regiments to use Government transport for their grain supply.

(*h*) With reference to (*b*), Silladar Native Cavalry regiments are, by their constitution, obliged to make all arrangements regimentally for the supply of grain required for the troops, horses, and baggage animals. There seems no good reason why a certain number of Government camels should not be handed over to each corps for the conveyance of grain from the outlying districts; the regiment being responsible for the keep of the animals.

Native States to maintain transport trains.

(*i*) Every endeavour should be made in future to induce Native States, when contributing their quota to the Imperial defence scheme, to maintain transport trains, instead of infantry or cavalry. The excellent and continuous work performed by the Jeypore and Gwalior Imperial Service transport trains throughout the late Chitral expedition, prove conclusively what immense assistance such an organized system of carriage can render.

Salt as a medium for the employment of Government carriage.

(*j*) The vast amount of salt, which in this country is a State monopoly, that is exported annually from the salt mines at Kalabagh and Khewra in the Panjab, affords another example as to how it is quite possible to work Government transport at a profit. At present this trade is entirely in the hands of natives, who act themselves as the carriers. The export of the commodity should be taken up by the State, and Government transport employed freely in distributing salt.

Suggestions and proposals by no means impossible.

Though some of the above ideas may be deemed a trifle far fetched and chimerical, they are not altogether unworthy of consideration. If carefully worked out in detail, much could be done to rid the State of the incubus which at present exists in the shape of thousands of animals which have to be kept up to meet possible military contingencies. By the adoption of any of these proposals, not only would the animals themselves benefit from more regular work, but the cost of their up-keep would be recouped by their utilization.

4. Registration of Transport in Peace Time.

Impossibility of the maintenance of sufficient permanent transport.

As it amounts to an impossibility, due to the question of cost alone, if to no other reasons, for the Government of this country to maintain sufficient permanent transport to enable the army in India to take the field on a large scale, such as would be required in the event of a war with Russia, or a third invasion of Afghanistan, any subject connected with the means which would enable the military authorities to draw upon resources other than those already existent, is not only of the highest importance, but at the same time affords an extremely wide scope for discussion, ideas, and suggestions. The method by which the permanent peace establishment can be expanded and supplemented is by hiring transport temporarily during war time, and on the completion of the campaign or expedition, dismissing it, and thus saving the State the cost of its permanent maintenance.

Necessity for adequate arrangements in peace time.

But as military operations in the East, due to climatic considerations, want of communications as exist in civilized countries; invariable scantiness of supplies in the region operated in, necessitates an unusually large proportion of transport being used; it is, therefore, not only of the first importance, but obligatory, that feasible and practical arrangements should be instituted to ensure hired animals being obtainable in sufficient numbers on the outbreak of hostilities.

Transport animals available in large numbers.

Fortunately India, especially the northern and western portions of the dependency, abounds with transport animals of every description, which the inhabitants of the country from time immemorial have used, and will continue to use, for their own profit and advantage. The material being available, all that remains to be done is to guarantee in a satisfactory manner its use when required. That object can only be arrived at by a sound system of registration in peace time.

Attempts already made to register transport.

For some years past an attempt has been made in Northern India to register transport animals, with a view to their subsequent entertainment on mobilization. But as it seems to have been more of a compromise than anything else, little real advantage has resulted. Up to the present, all that has been accomplished in this direction has been to appoint certain officers of regimental corps in various districts, who have been directed to prepare, in conjunction with the civil authorities, estimates as regards numbers and classes of animals suitable for transport purposes obtainable on emergency from each district. As these orders have entailed a considerable amount of harassing and extra work on the officers concerned with no extra emoluments, except a very small sum for the up-keep of an office and clerk, it can hardly be expected that the best results have been obtained. Moreover, as most of the enquiries have to be made through the medium of correspondence, it can be hardly supposed that the average district civilian, most of whom are by no means underworked, have been more eager than their military confrères to respond to the extra labour and work thrown on them. In addition to the above, occasional efforts have been made to collect and collate information concerning the capabilities of various portions of the country as regards the supply of transport animals, by detailing officers on special duty to tour in the districts and personally investigate the matter. From this latter course there is no doubt that much valuable and reliable information has been obtained. But as the lapse of time changes most things, data, especially of this description, notwithstanding however accurate and complete they may have been at the time of their compilation, five or ten years afterwards lose, to a very great extent, their reliability.

Measures suggested for registration of transport.

Having described the existing arrangements in force for the registration of transport, it would be as well to consider any means by which they might be ameliorated. What in the writer's opinion would seem to meet [illegible] system should be [illegible] [illegible] the [illegible]

[illegible] work, [illegible] [illegible] sir months [illegible] there will be every [illegible] for [illegible] a [illegible] and practical [illegible] the Panjab, [illegible] and the North-West Provinces, and all [illegible] of the country where transport is obtainable, would be [illegible] the area of which would depend on the amount of [illegible] known to exist in those quarters. To each officer [illegible] would be assigned; his duties would consist in touring in the cold weather, if necessary in the hot season as well, in his allotted circle. He would, by these means, inspect, pass, and finally register every available animal of every description suitable for transport purposes, and in addition equally note and register either actual owners, or in their places servants who would be prepared to accompany the animals as attendants, when required for Government purposes. Accurate and extensive lists and rolls would have to be prepared and kept up, showing all necessary data in connection with the various classes of transport, owners' names, places of residence, etc., etc. All cases, such as animals becoming either unsuitable or ineffective from any cause whatsoever, after original registration, being at once revised, by their being struck out of the register, and others substituted; the same method would be employed as regards attendants.

Advantages claimed for the system proposed.

By these means alone, it is maintained, in a very short space of time every suitable animal in each district would not only be registered, its whereabouts known, and be forthcoming on the shortest possible notice, but moreover it would secure a greater certainty of only suitable animals being selected. As an example of this it may be stated that a couple of weeks or so prior to the departure of the late Chitral Relief Force from Nowshera, officers were sent out into most of the districts in the Panjab to entertain hired transport in almost unlimited numbers. It is true that the animals required were obtained, due to the energy and exertions displayed by those to whom this task was entrusted; but a certain percentage was not suitable, and should never have been entertained. That such was inevitable, no reasonable individual could fail to expect; and it is clearly traceable to the work having to be carried out against time. This contingency, which has already occurred, and will in all probability occur again, can only be guarded against by registration being effected in peace time, on a rational and methodical system.

Example afforded by the late Chitral expedition.

It would also facilitate another very important factor, and that is, the speedy mobilization of every animal in a district, at places specially selected beforehand.

Speedy mobilization of transport ensured.

On this latter point too much stress cannot be laid, as it is of vital importance to a force about to take the field that the transport should be present and equipped, as well as all other component parts of the fighting machine.

Registration fee desirable.

While on this subject, it seems advisable to raise another issue, which, in the writer's opinion, has a very considerable bearing on this question generally,—namely, whether it would not be of subsequent advantage to grant to the owner of every animal, at the time of registration, some small annual fee for each animal so registered. This would then give Government a distinct lien on the services of the animals when required. It would undoubtedly make the system of registration popular with the natives of the country; and very probably eradicate any possibility of impressment, pure and simple, having to be resorted to. If only so small a sum as one rupee per annum was earned by the owner of every animal registered, it would most assuredly produce good results eventually.

Question of expense inevitable.

That of course such a recommendation entails fresh annual expenditure on the Government is obvious. But, as has already been pointed out, in the treatment of the question of the supply of attendants, it is quite beyond human ingenuity to devise any practical or business-like scheme when dealing with so wide a subject as the up-keep of transport generally, without in some way or another counselling fresh outlay. But if it can be satisfactorily demonstrated that such expenditure, judged by the results likely to be obtained, would rectify existing defects, there surely seems little reason that it should be withheld.

Advantages claimed far outweigh any question of expenditure.

In so far as the unnecessary and wasteful outlay, which invariably occurs when, owing to the non-existence of previous arrangements, transport has to be collected at any cost, greatly exceeds any sum that might be annually allotted to ensure its being obtainable when required, with facility of collection, and at the same time minimizing as far as possible any hardship or loss that might result to the owners from its appropriation. The immense sums that have to be disbursed when transport has to be got together, at almost a moment's notice, have eventually to be met by the Indian tax-payer; the only question affecting that individual being whether the total amount of the bill to be defrayed was absolutely necessary and unavoidable. But, on the other hand, there seems little doubt that, if adequate provisions were originated beforehand, great saving eventually would ensue to the State. At any rate, it is unlikely that the cost of the registration fee in peace time would in the aggregate exceed what has to be expended on the eve of an expedition in obtaining transport of even inferior quality. Moreover, the outlay under this heading can in peace time always be controlled, by the regulation of the numbers registered, either diminishing or increasing, as the circumstances might demand.

Economy more probable than otherwise.

Proposals.

Finally, to recapitulate the foregoing arguments, it is suggested that:—

(a) A certain number of appointments should be created, and filled by specially-selected officers, whose duties would consist in registering all available transport animals in the respective portions of the country allotted to them: and also in supervising every detail connected with the mobilisation of all such transport as they might select and register.

(*b*) In addition to mere registration, these officers would arrange for the purchase of animals in anticipation of such an eventuality arising as might render this desirable. This would not only be feasible but should involve no extra difficulties, as all that would be necessary in this case would be to select a certain percentage of animals from among those registered, whose prices would be fixed beforehand, as liable to either purchase or entertainment. This arrangement would entirely obviate the necessity of deputing purchasing officers, as now exists; the two duties—namely, purchasing and hiring—being amalgamated into one.

(*c*) A small annual retaining fee to be paid by Government to the owner of every animal approved of, passed, and registered; a contract, in every case, being entered into requiring that each animal so registered would be available for Government purposes upon reasonable notice being given.

Classification of animals registered.

Before finally quitting this subject, it is further suggested that the registration recommended should be divided under three distinct classifications: (*a*) animals which are registered, and receive the retaining fee, but which would be liable to purchase; (*b*) animals registered, and to which the fee would also be granted; (*c*) animals in the same category as (*a*) and (*b*), but to whom no fee would be assigned. From this it will be understood that the first two classes would represent the total number of animals the cost of whose registration would have to be annually provided for: the third class entailing no expense whatsoever, merely being registered, and acting as a reserve to the two former.

Financial part of the question.

Reference to the probable expenditure involved by these proposals will be found later on under the proper heading.

5. Arrangements for collecting Transport by Hiring and Purchase on Mobilization.

Method of registration as before suggested more suitable than present system.

As will have already been gathered from the remarks contained under the previous heading, if the ideas and suggestions with reference to the registration of transport are ever deemed to be of sufficient practical utility as to render their adoption desirable, nothing more need be advanced on this particular point. But, on the other hand, if it is proposed to adhere to the existing arrangement of hiring and purchasing transport when only actually required, as opposed to registration beforehand, then certainly the present system might in several respects be altered and improved upon.

Necessity of detailing experienced officers for this work.

The first point to be dealt with is the absolute necessity of detailing officers for this purpose who possess some former knowledge and experience of the animals they are required to select and pass. Too much stress cannot be laid upon this consideration; and the contention applies with even greater force in the case of purchasing outright than that of merely entertaining for a limited period: since in the latter case an animal can, when found unsuitable or unable to perform its work, be discharged with a minimum amount of loss to the State; whereas, if purchased, not only has it to be fed until destroyed, or otherwise disposed of, but its original cost is an item not to be lost sight of. Moreover, it should be remembered that although an officer may be an excellent judge of a mule or pony, he may be ignorant of the requirements and points of a serviceable camel or bullock; and therefore it should, if possible, be so arranged that each class of animal should be dealt with by the individual most fitted for the work.

Existing custom of employing contractors should be abolished.

The existing custom of employing "chaudris" or contractors for the entertainment of hired transport is one which undoubtedly could be abolished with advantage to the State and everyone else concerned. These so-called native gentlemen of position and influence, who are generally appointed, are only a source of hindrance than otherwise when transport has to be collected in large quantities against time. They generally fail to supply the numbers, or if they succeed, it is only after obtaining an exorbitant and enhanced fee for each animal entertained. They cannot themselves be depended on to select serviceable animals. They are, moreover, the chief cause of discontent among the owners, due to the fact that, when contractors are employed, the monthly pay for the animals supplied is made over in a lump sum to the contractor, who disburses it to the owners as he thinks fit: or, in plain language, defrauds the unfortunate sarwan or "drabi" in every possible way he can. This is made all the easier, inasmuch as the owner generally asks for and receives, upon entertainment, advances either in cash, or by food and grain supplied to himself and animals. This method of procedure is continued throughout the duration of the expedition, so that when the final settlement takes place with the owner, he is confronted with a mass of intricate accounts which require a far clearer brain than the average illiterate sarwan possesses to unravel. The result is that the matter is eventually settled to the owner's loss and the contractor's profit. In every case, from a mercantile point of view, it is conceded that the middleman is the individual who makes most, with the minimum amount of work and trouble, out of any transaction; and as when large numbers of animals are required, as has already been stated, the contractor invariably fails, why employ him at all? Prior to the departure of the late Chitral expedition, a contract was given, for the collection of the camels in the Panjab generally, to one of the most influential native contractors in the province. But it was soon evident that he was unable to meet the call made upon him. The matter had to be taken out of his hands, and British officers detailed at the eleventh hour to collect the animals. No doubt the contractor in question had many unusual difficulties to contend with, and had the number of animals been smaller he would have executed his task satisfactorily. But as it has now been proved that the work of collection can be performed by the direct medium of an officer, it seems strongly advisable to abolish the system of "chaudris" or contractors altogether.

Officers to be supplied with an efficient office establishment.

Officers, when detailed for either hiring or purchasing transport animals, should in every case be supplied with an efficient staff of subordinates, such as agents and clerks, and, if possible, a smart departmental warrant or non-commissioned officer. This may, at first sight, appear a small consideration, but when one, or possibly two officers are deputed, at a moment's notice, to proceed to a certain locality where they have to deal with some hundreds, possibly thousands, of animals, which have been collected by the civil authorities, and which have to be selected, passed, branded, and despatched with the least possible delay to the base of operations, it is of the utmost importance they should have at their command subordinates who can perform the duties and work that is expected of them, and upon whom reliance can be placed. The preparation of service-books for the attendants, of descriptive rolls of the animals, and of "itala namalis," is not the work of an officer, though he is, of course, responsible for their correctness in every detail.

But in many instances, owing to the paucity and absolute inefficiency of the clerks and agents, supplied during the months of March and April 1895, when transport was under collection for the Chitral expedition, officers were obliged, in addition to their other duties, to actually prepare these documents with their own hands. Such a state of things is neither desirable nor is it conducive in any way to the speedy despatch of animals which may be urgently required.

It is, therefore, suggested that this difficulty should be met by the formation of a reserve of agents and clerks in peace time; or if this is not feasible on the score of expense, that a system of registration might with advantage be introduced—on this principle, that no persons belonging to either of the above classes should be so registered unless they had first proved themselves, by means of an examination, qualified to execute efficiently the particular work they would be called upon to perform. But even with this safeguard, it is imperative, in the case of two or three subordinates being detailed as an office staff to an officer deputed to entertain or purchase transport, that certainly one of the number should be a permanent departmental man, since, however well qualified the temporary hands may be as regards mere clerical work, they require the supervision of one who has had, possibly for years, technical departmental work.

Before despatch of hired transport all gear should be inspected.

Before finally despatching hired transport from the locality where entertained, all saddles, gear, etc., should be most carefully inspected, and the owners forced to replace or renew any portion of their animals' equipment which may be not thoroughly serviceable. Natives in this particular, like in many others, are difficult to manage and extremely obstinate: imagining, with no cause at all, that a loading rope or new sundka saddle can be obtained as easily hundreds of miles across the frontier as on the Grand Trunk Road. Entertaining officers should be held strictly responsible as to the supervision of this point, as no animal, no matter how steady and suitable it may be in other respects, is of the least value as a means of transport, unless its gear is sufficiently serviceable to enable it to carry a load without fear of a sore-back. The Commissariat Department usually arrange to have on service a certain supply of such articles as may be required to replace gear in use by hired transport. But if in every case, as now suggested, greater supervision was exercised with regard to this detail, before despatch of hired transport across the frontier, this provision on the part of the Department might be dispensed with, or at any rate reduced to the smallest possible minimum, in order to meet unavoidable contingencies.

Transport when collected should, if great emergency exists, be despatched by rail to the base. This remark applies to every description of animal, except the camel. This latter animal should, if possible, on no account be railed. He is by temperament timid and obstinate, and therefore exceedingly difficult to entrain. His immense bulk precludes more than two or three being loaded together in the same truck. In order to prevent his escape he has to be bound head to heel: this, combined with great variations of temperature for several days in an open truck, generally produces the result of his being on arrival at the base of operations more dead than alive—at any rate useless for work for some time.

6. Financial Aspects of Proposals.

Inability to treat question in detail.

This portion of the paper will of necessity be of the briefest. The writer thoroughly believes in the two well-accepted maxims that statistics prove nothing, and that figures may be made to prove anything. Elaborate and intricate estimates can be produced and worked out in an office. On paper they appear above criticism, but when the actual matter which they concern is taken in hand, it more than often occurs that they are not so reliable as supposed. It is, therefore, on these grounds, combined with the want of reliable records and information, that this matter is treated in a somewhat scanty and imperfect manner. Moreover, as the suggestions and proposals advanced in any of the preceding five headings do not involve, with the exception of two of them, any especial call for extra expenditure, there seems little object in attempting to deal any further with this matter than is absolutely necessary. The writer will therefore merely consider those that have to be answered and which require some further explanation in order to render them clear and explicit.

Reserve of attendants.

Turning to the question of the reserve of attendants, the first consideration that arises is the amount of pay that it would be advisable to grant to an attendant while serving in the reserve. Three rupees per mensem is the allowance made to a sepoy under similar conditions, and there seems no reason why a transport attendant should draw less: he is certainly in this particular just as valuable as the native soldier.

If, then, the pay, while in the reserve, is fixed at Rs. 3 a month, the expenditure required to meet this will in the

1st year equal 2,150×3×12=Rs. 77,400,
2nd „ „ 1,075×3×12=Rs. 38,700=Rs. 1,16,100,

and so on, gradually increasing up to the tenth year. As already previously shown, this source of expenditure could always be controlled by diminishing the number of attendants in the reserve.

Permanent transport officers and registration.

With regard to the appointment of permanent transport officers, and the fee recommended to be granted on registration, the same difficulty occurs, as regards the actual expenditure that would be entailed if this proposal were adopted, as both the number of officers appointed and the number of animals registered cannot now be definitely settled. But assuming that six permanent transport officers, on a staff salary of Rs. 300 a month, were appointed,—that is, three for the Panjab, one for Sindh, and two for the North-Western Provinces,—that would amount to annually—

6 officers' staff allowance Rs. 300 per mensem.
" travelling " 150 "

300 × 6 × 12 =	21,600
150 × 6 × 12 =	10,800
Total .	32,400

The registration fee would entirely depend on the number of animals to which it was granted, therefore no definite calculation can be made.

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look like Fig. III. If thus equipped, tents would hardly ever be required at all, as by excavating the whole of the inside space of the tent to a depth of two feet, whenever remaining in the same camp for any

Permanent transport officers and registration.

With regard to the appointment of permanent transport officers, and the fee recommended to be granted on registration, the same difficulty occurs, as regards the actual expenditure that would be entailed if this

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OCCASIONAL PAPERS AND REPRINTS.

A tente d'abri and waterproof sheet combined.

By I. S. C.

In the July number of the U. S. I. I. Journal "Frontier Soldier," in his "Notes on Mountain Warfare," suggests that, in place of waterproof sheets, men be supplied with sheets of waterproofed khaki drill, which would supply material for both ground sheets and *tentes d'abri.*

A sheet of khaki drill, waterproofed, size 9′ × 4′ 8″, would, I think, answer this purpose; and, if waterproofed by the new process, which the War Office at home is utilising largely for blankets, etc., should be as cheap as, if not cheaper than, the waterproof sheet now issued, and would be lighter; moreover, in all probability it would last longer, as being less liable to crack and tear than the waterproof sheet, which this latter is apt to do very easily.

The size of sheet I mention would, with the addition per man of one short stick three feet long, two small iron pegs, and one piece strong cord (which could be utilised for tying up bedding), supply every two men, or multiple of two men, into *tentes d'abri* and ground sheets.

The space inside the tent thus formed would, for two men, be 7′ × 4′ 8″, for four men 7′ × 9′, and so on. The sheet which was used for the ground sheet would be laid *across* the tent (inside, of course), and the two feet in length thus gained would be folded over, and under this all extra clothing could be placed to form a pillow. Each sheet should have metal eyelet holes at all four corners and at the centre of both the longer edges for tent sticks and pegs; all these eyelet holes should be two inches from the edge of the sheet.

Further, one of the longer edges of each sheet should be pierced in its entire length into eyelet holes for lacing sheets together; these eyelet holes should be sewn, or have leather rings, as being less likely to let water through than metal-lined holes, and should be two inches from the edge. Thus the appearance of a single sheet would be as in Fig. I. The best combination would be that for four men, consisting of four sheets, four sticks, eight pegs, and four pieces of cord, which would be utilized thus :—two sheets to form *tentes d'abri,* size 7′ × 9′ × 3′ high at the ridge, three sticks to form tent poles (one would be spare), six pegs to peg down the ends of the sheets to the ground, two pieces of cord to lace together the two sheets forming the tent, and the remaining two pegs and two pieces of cord to stay up the two end tent-poles. By having eyelet holes two inches from the edges we obtain an overlap of four inches when the sheets are laced together, which should keep out all rain. The appearance of the tent thus formed would be as in Fig. II. The remaining two sheets laid across the tent as ground sheets would look like Fig. III. If thus equipped, tents would hardly ever be required at all, as by excavating the whole of the inside space of the tent to a depth of two feet, whenever remaining in the same camp for any length of time, the men could make themselves very comfortable. If the weather was cold, mud fireplaces could be made at one end of these excavations; and if hot, thatchings of grass or bushes could be added to the tent covering. These excavations could not perhaps be made if the soil was too damp, but this is seldom the case anywhere on the North-Western Frontier at any rate, where trenches dug outside would carry off all water. The saving in transport would thus be considerable. These excavations would also afford the men some cover against night "sniping" (Fig. IV). Ends could be stopped up with mud or stone walls, and doorways be made. If five feet sticks could not be procured to replace the three feet sticks when digging these excavations, the earth directly under the tent poles should not be interfered with, but should be formed into rough pillars. The ground plan of the excavation would be as in Fig. V. Another advantage possessed by this type of sheet is that the extra length and width would enable a man to roll up his bedding, etc., so completely as to prevent the wet ever penetrating. With the narrow waterproof sheets now in use, the wet often gets in at the ends.

"THE HUMAN ANIMAL IN BATTLE."

Under the title of "The Human Animal in Battle" Mr. H. W. Wilson has in this month's *Fortnightly Review* gone into a very important military subject which has not as yet received as much attention as it deserves. The best-drilled parade army is useless in the field if devoid of courage. It is rather a bold assertion,—and yet we believe that our readers after examining it carefully will admit its correctness,—to say that practically all men are naturally cowards. This will be considered a humiliating remark by civilian Englishmen, for the nation at large considers that every unit of it is naturally brave, whilst amongst the higher classes an accusation of cowardice is regarded as the most deadly of insults.

Mr. Wilson observes truly that courage is simply control of the nerves, and is largely due to the habit of confronting danger. He quotes General Sherman, who thus defines courage:

"All men naturally shrink from pain and danger, and only incur their risk from some higher motive, or from habit, so that I would define true courage to be a perfect sensibility of the measure of danger and a mental willingness to incur it, rather than insensibility to danger, of which I have heard more than I have seen."

It is nevertheless the case that some men are, *pace* General Sherman, naturally insensible to danger. The writer of this article has known personally two instances of apparent unconsciousness of peril. In both cases they were men who obtained the Victoria Cross, and both possessed magnificent physique. One was a dull man with no cultivation of mind, and wholly destitute of imagination. It was probably the sluggishness or absence of imagination which prevented him from anticipating or realizing peril, and which made him brave. In the other case there was plenty of ability and culture, much quickness of perception, and his intrepidity may be attributed to his fine physique and pride of race. A third case may be mentioned, that of a man of high culture and power of imagination, whilst also a man of very fine physique: we refer to Colonel William Hope, V.C. The writer of this article was present once when Colonel Hope tried a gun which he had invented. Colonel Hope insisted on firing it off whilst standing at the breach, in spite of remonstrances. He realized the danger and made all spectators retire under cover. As to himself he saw that if the inventor did not show confidence he could not expect confidence from the soldiers and sailors who he hoped would work it in the future. The gun burst, and when the spectators hurried up Colonel Hope was seen with a cut from a splinter on his face, and pale with disappointment, and yet as calm and resolute as if he had not just escaped death by a miracle. We must, however, in the main agree with Sherman, who maintained that everyone shrinks from danger, and with Skobeleff, who considered that there were some men who could never overcome fear and were useless as soldiers. In our view courage is not natural to the many. It is only acquired by familiarity with danger, national or personal pride, *esprit de corps*, strong religious belief, and discipline. Further, we are inclined to hold that in the matter of courage most races are very much alike. The Egyptians under Arabi were worth little, but under British training and example those of Kitchener have become formidable to one of the bravest races of the present day, the Soudanese. Certain natives of India, fighting against us, have at one time displayed the greatest poltroonery, at others—especially when forced to a resistance *à outrance*—they have behaved like heroes. When fighting on our side the native regiments, especially the Goorkhas, Sikhs, and Pathans, have fought magificently both in the offensive and on the defensive. As Mr. Wilson points out, religion is a very powerful incentive to courage. The horsemen of old believed that they only lost life on earth to obtain a more joyous one in their Valhalla. The Mohammedans are assured that if they die when fighting the infidel, they will pass at once to Paradise. The crusader reckoned earth well exchanged for Heaven. Now, however, among European races doubt or infidelity cause many of them to feel uncertain about the future, whilst being certain that this life may be ended in battle. Familiarity breeds contempt or indifference, and a soldier having escaped peril once or twice, thinks that he is destined to survive the campaign. The man who believes not in religion, believes in fate, and in that wholesome soldier's proverb that "every bullet has its billet."

Turning to the battles of the future, Mr. Wilson points out that few men now survive who know from experience what war between two European armies means, and that probably the horrors of the combat will be largely increased. Moreover, he considers that with the increase of terrors there is a weakening of the nerves:

"To meet that trial the nerves of the modern civilized man are less fit than they were in the past, as the increasing rush and worry of our existence, the railway, the telegraph, the herded aggregations of human beings in cities, conduce to nervous complaints. . . . To counteract this downward progress, training and discipline grow ever more and more necessary."

That training and discipline coupled with national pride and *esprit de corps* will do much, is proved by the gallantry of our men at Alma. Of the army that fought in 1854, scarcely any but a few officers of rank had ever heard a shot fired in battle, and yet how well all ranks bore themselves. The same may be said of our cavalry at Balaclava—practically their first action.

It is certain nevertheless that the more men have been accustomed to danger apart from the risks of battle, the better they will conduct themselves on the battle-field. Hence Mr. Wilson points to dangerous sports and adventures as an admirable preparation for war. Fortunately for us most of our national sports contain some element of danger, and we are therefore to a certain extent better fitted to face the perils of the battle-field than are other nations. This is a strong argument against those who protest against certain sports as involving a risk of life. It should be remembered also by commanders of troops without experience of war, that the nerves both act and are acted on by the stomach. Care should therefore be taken to bring men into action as far as is possible free from excessive fatigue. It is no disparagement to Englishmen to say that they always fight best when well fed.

THE LEE-METFORD BAYONET.

The *Broad Arrow* lately had an interesting letter on the Lee-Metford bayonet. If the writer's arguments are not to be gainsaid, this bayonet leaves great room for improvement:—

"Now that the Lee-Metford rifle has at last been served out to the Volunteers, perhaps you will permit a Volunteer to point out the absolute inefficiency of its bayonet as a fighting weapon, *i.e.*, as a thrusting weapon for a man on foot. The rifle with bayonet fixed is much shorter than the Martini-Henry weapon, and has this further disadvantage, that the length is not taken off the rifle, but off the length of the blade. Given proper stability, it may be taken as an axiom that the longer and narrower the blade, the greater are the chances of its owner getting his point home; and conversely, it must be plain even to the veriest tyro in the art of fencing, that it is much easier to parry the thrusts of a relatively long barrel and short bayonet, than those of a medium length barrel and relatively long bayonet. The movements of a thick, heavy barrel can easily be seen, its thrusts parried, its parries deceived. Then, to make matters worse, the bayonet-blade is flat, of all patterns the worst for a quick pass, and is fitted with a hilt and cross-guard. For what purpose these last were added it is difficult to surmise (the bayonet by itself is nothing but a dagger, and a very poor one at that), unless the authorities, in their zeal for Italian swordmanship, desired to introduce the Italian method of fighting with knives, as an improvement on the noble art of self-defence hitherto in vogue in these parts. To resume. The Lee-Metford rifle and bayonet are very heavy, and too short; the weapon does not make up in length of reach to its owner what he loses by inability to handle it quickly owing to its weight. This point was very strongly brought out, and, as I submit, proved, by the results of what took place at the Royal Military Tournament competitions for Auxiliaries in the Home District on the 15th, 16th, and 17th of last April. The spring bayonets used there were identical in shape of butt, length of blade, total weight and total length with the weapon at present under discussion. The result was that in the mixed combats (sabre *v.*

bayonet) the bayonet was seen to be terribly over-matched in all cases where the 'sabreur' chanced to be the taller man. Not only had the latter the right to seize his opponent's weapon with his left hand by any part of the barrel (no inconsiderable advantage when we remember how short a blade the bayonet has), but it could be seen that, at most, the bayonet's extra reach in no case exceeded two or three inches—a reach which was more than neutralised by his uncertain grip with the right hand, and the consequent fatigue which must ensue from a long bout of rapid fencing. The uncertain grip with the right hand to which I allude refers to the practice, universal with both Auxiliaries and Regulars, of grasping the spring bayonet with the right hand round the butt, instead of just below the trigger-guard. It is done to get a little extra reach on a short, heavy weapon, and the result is constant disarming by a smart beat. That grip is unsafe for all men with hands less than ten inches long. The Lee-Metford rifle and bayonet, of which the spring bayonet alluded to above is the play-weapon, is much too short, and in real fighting would be wielded with pernicious faults of style, faults directly attributable to a weight which is out of all proportion to its length. The length and weight of the rifle minus bayonet are determined by considerations other than those which form the subject of this letter, but the object of the writer is to urge a redistribution of the fifteen ounces which the bayonet weighs, by abolishing the short flat blade, with its hilt and cross-guard, and substituting for it a longer narrower bayonet with triangular blade, and locking-ring attachment.

"If the bayonet is to be regarded as a thrusting weapon, by which an infantryman is to slay his foe, if it is placed in his hands for that one purpose, and no other, we must find out what is the best thrusting weapon, and as nearly as the other requirements of our compound arm will allow, endeavour to fulfil the conditions laid down by the fencing experts of the age. Now I submit that there is not a single one of those conditions which has not been violated in the Lee-Metford bayonet. The ideal thrusting weapon is the duelling small sword. I suppose it is more easy to make a fatal thrust with this weapon than with any other. Its practice weapon is the *épée de jeu*, or more commonly, the fencing foil. And nearly all the conditions which apply to foil-fencing apply also to bayonet-fencing. Yet though it is notorious that the small sword will beat the sabre for thrusting nine times out of ten, because the triangular blade is more difficult to watch, and quicker for feinting, we are given a flat-bladed bayonet whose feints can be seen twenty yards off. Again, are we supposed to strike with the edge of the bayonet? If not, why is it given, except as a direct incentive to careless men to use their bayonets for cutting and chopping hard substances?—a most improper use to put them to, but unfortunately only too common. The authorities are so alive to the superiority of a thrust over a cut, that of late years we have seen the lance generally introduced into all cavalry regiments, and infantry officers given straight-bladed swords, and recommended only to use the point. Surely, then, the edge is barred for bayonet-fighting, and that being so, why handicap the infantryman by giving him the worst sort of blade for thrusting? He is given a short broad-bladed little dagger with a hilt and cross-guard on the end of a heavy rifle, and his only chance of getting his point home is to thrust with great strength, thereby probably overbalancing himself, when one of the first things a fencer is taught is to thrust quickly and easily, and get back at once on his guard. This advice, ten times more valuable to a bayonet-fighter, is by him almost impossible of adoption. Coming from the blade to its hilt and cross-guard, and taking the last first, it will generally be conceded that a sword with a blade only twelve inches long could never be used for fighting with, so that being so, it is difficult to see why the authorities, with superfluous generosity, have fitted it with a cross-guard to protect the hand. With the hilt we at once come to one of the most fruitful sources of loss of life to our men when on active service. For though a triangular bayonet with no handle can be looked upon as very little else than an offensive weapon, yet with its triangular blade flattened out, and given a cutting edge and a comfortable handle, it directly becomes a domestic implement, which perverted ingenuity can employ as a ham knife, sardine opener, wood chopper, cheese taster, kitchen poker, etc. If in course of events its owner suddenly wants it to defend his life, he finds that its temper having been quite spoilt by these uses, it doubles up like a stick of solder and disaster ensues. Nothing was proved more conclusively with regard to the bent bayonets in the Soudan Campaigns than this, that they were good enough till absolutely ruined by bad usage. The best foil blades going can be tied into knots if passed a few times up and down through the flame of a gas jet. If a man is given a knife with a handle he will treat it as such, if a spear head for thrusting he will reserve it for that use. I suggest that a long narrow triangular bayonet with no hilt and lightly made, not made as if it were to be used for breaking open iron safes, but adapted for giving a light swift pass, should be substituted for the weapon at present in use. In conclusion I might point out that both France and Germany have lately adopted new bayonets of improved patterns both much longer and more pointed than our own."

LORD WOLSELEY AND THE INDIAN ARMY.

A sensible letter in the *Broad Arrow* on this subject will be read with interest in India, where Lord Wolseley's utterances have given rise to a discussion in a leading daily paper, some letters of which might have been more happily conceived. It should be borne in mind that the real question at issue was not the value or otherwise of our Indian troops, but the monetary settlement between England and India in regard to British troops furnished by England, and for which India pays.

"I am a very regular reader of the *Broad Arrow*, and as a progressive soldier I realise that the Service has much for which to thank you. Perhaps therefore you will allow me to trespass on your columns to express my views on a matter which is exercising the minds of both lay and military writers. I refer to the Commander-in-Chief's evidence before the Indian Finance Commission. Now, I admit that Lord Wolseley has an unfortunate knack of getting into difficulties—his warmest admirers will allow that. At the same time he has the happy compensating faculty of getting out of them. As yet, however, he has not put himself right with the Indian Army; but I think the simple explanation of his recent unfortunate utterances—if I may venture to explain for him—is that, in giving evidence before the Indian Finance Commission, he said more than he meant. The question in connection with which his evidence was taken was as to the share Indian revenues should bear of the home charges of the Army, so far as it exists for Indian purposes. Lord Wolseley has daily experience of the difficulty of maintaining the Service in a condition of efficiency on the sum of money annually voted by Parliament, and he, of course, must feel strongly when Imperial funds are expended upon purposes for which Indian moneys should provide. The advocates of the Indian side of the question naturally extol the excellence and usefulness of the Indian Army, and point to the advantage they consider its existence to be to the Empire generally. Lord Wolseley's view, I take it, is that in the monetary settlement with India we get the worst of it, and it was in declining to admit the Imperial value of the Indian Force, which its friends claimed for it, that he uttered the disparaging sentences which have got him into trouble. I admit that he spoke loosely, which a man in his position should not do. But who would have supposed that the conversation between a few officials on a question of account-keeping would have become within twelve hours matter for the criticism and censure of the whole British Empire? Lord Wolseley cannot say that he did not speak as reported, but it is certain he had no intention of publicly disparaging the Indian Service. That the Indian Army will be satisfied of this sooner or later I am convinced, and the unpleasant episode will be forgotten and forgiven. Meanwhile Lord Wolseley probably wishes he had not spoken as he did. At the worst, however, this deprecatory reference to the Indian Army was but an unlucky incident, and that it will be a matter of more than passing interest, when the surrounding circumstances are taken into account, I take leave to doubt.

LONG-DISTANCE MARCHING AT THE ABBOTTABAD ASSAULT-AT-ARMS, MARCH 1896.

The following extract from a detailed report by Lieutenant-Colonel Martin, Commanding at Abbottabad, has been forwarded to us by Major-General Sir Power Palmer, K.C.B. It deals with a subject of very general interest, and shows what small and picked bodies of well-trained troops can do.

CONDITIONS FOR LONG-DISTANCE MILITARY MARCH.

Squads to consist of 5 files and 1 non-commissioned officer.
Entries limited to two teams per battalion.

1.—Squads to be in marching order:—
Marching order as for service to include 70 rounds of ammunition, water-bottles filled: cooked rations in havresacks. At the finish the tin can be empty; ration to be eaten on road.

2.—The squads will be inspected by the Committee before starting.

3.—There will be ½ hour's interval between starting of each battalion's squads. The two squads of any one battalion to start at the same time.

4.—A British officer will accompany each squad; he will make notes regarding march, etc.

5.—The squads to march in fours or file, which may be opened out at discretion.

6.—Halts can be made by non-commissioned officers at discretion.

7.—Men falling out on the road can rejoin squad, but each man falling out must have another man left with him. If two fall out together, one man must be left with them. If more than two men fall out, two extra men must be left with them.

8.—A mule will accompany each squad.

9.—On arrival within 100 yards of the winning-post, each squad will come to attention. On reaching goal each squad will form line and be inspected by Committee at the shoulder.

INSTRUCTIONS FOR BRITISH OFFICERS ACCOMPANYING SQUADS.

A British officer to go with each team and—

1. See that it keeps to the right course.
2. Note how it keeps its formation.
3. Note how the halts are carried out.
4. Note men who fall out.

INSTRUCTIONS FOR JUDGING COMMITTEE.

1.—Inspect teams before starting.
See that men have
1 day's cooked rations in havresack,
Water-bottles filled,
70 rounds of ammunition, and
Complete marching order kit.

2.—Start teams and take time of each.

3.—On arrival inspect teams.
No rations or water need be brought in.
Take time of each.
Note condition of the men.

Three teams entered, *viz.*,
A Sikh team from the 1st Panjab Infantry,
A Dogra team from the 1st Panjab Infantry,
A Gurkha team from the 1-5th Gurkha Rifles,
and started in the above order at intervals of half an hour the first starting about 7-30 A.M.

The day was cool and cloudy, with rain threatening. Rain had fallen during the previous night and made a portion of the course in the valley very muddy and heavy going.

The Sikh team performed the distance in 3 hours and 21 minutes, and came in over the last and flat portion of the course at the double. In addition to this, this team doubled about 11 miles and made four halts of about (1) five minutes, (2) two minutes, (3) two minutes, (4) eight minutes, and the men kept together all the way.

The Dogra team came in in 3 hours and 49 minutes. Two men having fallen out, joined the team very shortly. After its arrival, the men of this team showed more signs of being done up than the Sikhs and Gurkhas.

The Gurkha team came in in 4 hours and 4½ minutes. Four men fell out, two of whom were left to look after the other two in accordance with the rules. Most unfortunately the men who composed the Gurkha team had been allowed to run in a *khud* race a few days before, and several of them cut their feet and could not run in the race, so that the team was half composed of men who had not been trained. One man belonging to the Sikh team had also run in the *khud* race.

On arrival the teams were all inspected. The men were not exhausted and were quite fit to have met an enemy. All the teams carried greatcoat, caps strapped on their backs.

The distance of the race was 16 miles, up and down hills, over fields and by roads of all descriptions, part of the course being very heavy. The Sikh team therefore marched it at the rate of 4·8 miles an hour, or deducting halts, over 5 miles an hour—a performance that is, I consider, worthy of notice.

THE BATTLE-SHIP *CÆSAR.*

Her Majesty's ship *Cæsar,* which has been floated out of dock at Portsmouth, is a vessel of the *Majestic* class, the principal dimensions being:—Length between perpendiculars, 390 ft.; breadth, extreme, 75 ft.; mean draught of water, 27 ft. 6 in.; and displacement when fully equipped, about 15,000 tons. The *Cæsar* will be fitted with twin screws, each driven by an independent set of vertical triple expansion engines, capable of working up to 6,000 indicated horse-power, or a total of 12,000 for the two sets of engines, with a working pressure in the boilers of 150 lb. per square inch, and an air pressure in the stokeholds equal to one inch of water. With this horse-power a speed of about 18 knots will be realised. The amount of coal usually carried is 900 tons, but provision is made for stowing 2,250 tons. The disposition of her protective armour is similar to the *Majestic* and *Prince George,* the arrangement combining the advantages of the turtle-back deck of the cruisers with those of the citadel armour of former battle-ships.

The armour, which varies in thickness from 6 in. to 14 in., consists of steel plates, having the outer surface carburised by the Harvey process, which greatly increases the resistance of the plates to penetration. Protection is afforded by this armour to the machinery, guns, and magazines. Two masts will be fitted, each having two fighting tops. Each of the latter will carry three 3-pdr. Q.F. guns, with the necessary magazines and equipment. A steel derrick, about 61 ft. in length, will be fitted on the mainmast for lifting the heavy boats into their positions on the skid beams, steam winches being provided for working. On the foremast a wood derrick will be fitted for lifting the lighter boats, and for coaling purposes. Temperley's patent transporters will be supplied for use with these derricks when coaling. At the top of each lower mast, a distance of nearly 100 ft. above the water, a platform will be built, carrying a powerful search-light projector. A semaphore for long-distance signalling will be fitted on the main topmast head, a height of about 170 ft. above water. Eighteen boats will be carried, including four steamboats. Three of the latter will be capable of acting independently of the ship for purposes of torpedo attack, being fitted for discharging 14-inch Whitehead torpedoes, and in the case of one of them, the spar torpedo in addition. Four of the light boats will be carried in davits, so that they may be quickly lowered when required for use as lifeboats.

The main armament will consist of four 12 in. B.L. guns, 12 6 in. Q.F. guns, and 16 12-pdr. 12 cwt. Q.F. guns. The 12 in. guns will be fitted in pairs in two circular armoured redoubts, one at each end of the ship, and will be mounted on revolving turntables, the whole being worked either by hydraulic or by hand power. Armour shields will be fitted to give protection to the guns. The 6 in. Q.F. guns will be mounted in casemates, eight on main deck, and four on upper deck, and protected by 6 in. Harvey armour. The 16 12-pdr. Q.F. guns will be mounted on the main and upper decks. The armament will be completed by 12 3-pdr. Q.F. guns in the fighting tops, on the masts, two 12-pdr. 8 cwt. Q.F. boat and field guns, and eight ·45 in. Maxim guns mounted in suitable positions. Twenty-two torpedoes will be carried which can be fired from four submerged tubes, two forward and two aft, and one above-water tube at the stern. Six search-light projectors, worked by three dynamos, each of 600 ampères, will be carried; and to complete the protection against torpedo attack, the vessel will be fitted with the latest system of net defence.

Provision will be made for lighting the ship throughout by electricity. As an alternative, in case of a breakdown of the electrical apparatus, Colomb's lamps will be fitted throughout. Ten steam fans will be used for the purpose of ventilating the working and living spaces, two for the ventilation of the engine-rooms, and eight for furnishing the forced draught for the boilers. A complete system of voice pipes will be fitted throughout the ship, so that all orders may be transmitted from the protected look-out positions to the various fighting stations. Upon completion the *Cæsar* will be commissioned with a complement of 758 officers and men.

AMERICA—PNEUMATIC GUNS.

Extensive trials have lately taken place in New York and San Francisco with the 15-inch pneumatic gun.

At New York an 8-inch shell weighing 350 lbs. and containing 100 lbs. of gelatine-dynamite was fired at a cliff three miles off. The shell struck the rocks and burst, making a hole 6 feet deep and 30 feet in diameter. The maximum (15″) shell was then fired so as to strike the water at a distance of 2,100 yards. This shell weighed 1,100 lbs. and contained 500 lbs. of dynamite. On touching the water it burst, sending up a column of water for a great height. The report was heard 30 miles off. The compressed air was supplied from a machine with subterranean connection, a mile away. The most satisfactory results were obtained in some further experiments as regards rapidity of firing and precision. Five unfilled shells were fired in quick succession and fell within an area 7 × 7 yards on a sandbank. The shots were fired within 10 seconds of one another, and owing to the removal of the pressure on the barrel the gun became cooler instead of hotter. The gun is laid automatically as follows:—The area of the bay and the entrance to the harbour is divided into imaginary squares, to which a certain pressure of air and a certain elevation corresponds. Having found the square containing the vessel to be fired at, the gun is aimed by pressing a knob corresponding to that particular square.

A most favourable report has been drawn up by three artillery officers who were present during the experiments with the three 15″ pneumatic guns mounted at the entrance to the San Francisco harbour. About 150 uncharged shells were fired within three hours. Three small (8″) shells were fired in succession at 1,500, 2,000, and 2,500 yards, and a charge of 100 lbs. of dynamite was burst against rocks two miles across the bay. Both the aiming apparatus and the time-fuzes worked faultlessly.—(*From "The Vedette."*)

REVIEWS OF RECENT BOOKS.

GUNS AND CAVALRY.

By Major E. S. May, R.A.

This is a most interesting book, written apparently primarily for horse artillery and secondarily for cavalry officers. Its object is to consider how best horse artillery can perform its *rôle* of supporting cavalry in the field.

It is divided into six chapters, of which the most practically instructive seem to be those on the mobility of guns and on opportunities on the battle-field; the most interesting and suggestive, those which treat of the action of guns and cavalry together, and give examples of co-operation when acting as an independent force. Major May, while preserving all his regimental pride in the Horse Artillery as "the light of the line and pride of the army," is quite sound in his views as to the necessity of horse artillerymen remembering that when working with cavalry, which in such cases is the most important arm, the first and foremost consideration must be how to assist and support the cavalry.

His arguments for the imperative necessity of horse artillery having as little weight as possible behind the teams seem irresistible.

The historical instances given in the 3rd and 4th chapters are in most cases new to the ordinary student of military history who has not made horse artillery a special study; and even when not new, will probably present themselves in quite a new light to a cavalry or infantry officer. They are of great interest and picturesquely and tersely put.

A cavalry officer might perhaps dissent from one or two of his conclusions. For instance, anyone who in India has formed part of a first line of twelve or fourteen squadrons advancing towards an enemy, might not perhaps agree that nothing decisive is ever accomplished except by a flank attack. Similarly a modern cavalry soldier who has stood on the heights of Tronville, mentioned in page 150 of this book, would probably think that a much greater result would have been gained by a cavalry charge of the bivouac, and pursuit supported by the guns, than by keeping back the cavalry and opening with the guns as was actually done. These, however, are mere differences of opinion.

The book winds up with a chapter on machine guns and mounted infantry in which the author shows that machine guns can never replace horse artillery. This does not appear, however, to have been ever seriously contended; but there is little doubt that when working in conjunction with cavalry and guns, machine guns have great opportunities of advancing unnoticed behind the squadrons to decisive ranges and pouring in a hail of bullets on the advancing cavalry from the "straight in front" position which Major May advocates, without any danger of masking the shock action of the squadrons which happen to be immediately behind. They can also from that position slip through the interval of squadrons with extraordinary ease without inconvenience to themselves or to the cavalry line.

To conclude, Major May has written a unique book for which he deserves the thanks of all gunners and cavalrymen.

SMALL WARS: THEIR PRINCIPLES AND PRACTICE.

By Captain C. E. Callwell, R.A.

It is a difficult matter to define what is, and what is not, a small war, and not a few will demur to the interpretation of the term advanced by the author of the work under notice. Unless, we are told, both sides are represented by regular troops, the operations will come within the definition. Captain Callwell quotes the recent conflict between China and Japan as an example of one of these minor wars; yet greater issues or greater interests were rarely involved than in that struggle. Can a conflict, the result of which might seriously have affected the whole world, and which did call forth the intervention of the Great Powers, be with any propriety called a "small war"? Again, were not Arabi's followers in 1882 regular troops, and if so, why is the war of that year included in the same list with the Ashantee Expedition and the Umbeyla Campaign? It is true that Mr. Gladstone drew a subtle distinction between war and "military operations," and spoke of our efforts in Egypt fourteen years ago as coming under the latter designation; but then Captain Callwell is a soldier, and soldiers should avoid Gladstonese! However, the object of this little book is to give a sketch of the principles and practice of small wars as regards strategy and tactics, and of the broad rules which govern the conduct of operations in hostilities against adversaries as to whom modern books on the military art seldom take account. It is very necessary that such a work should appear, for whilst we are daily more and more insisting upon the "bookish theorist," and whilst our officers are compelled to be continually studying and endeavouring to follow Continental methods, small wars are more numerous than ever, and in them a man has largely to rely on common sense and the everlasting principles which underlie all warfare. Not only that, but he must forget many of the lessons he has previously imbibed. What might do very well if he were fighting Frenchmen or Germans on the highly-cultivated plains of the Continent, will frequently be of little use when working against wild tribes on the peaks of the north-western frontier of India, or against dacoits in the swampy jungles of Burma. Captain Callwell goes most closely into all parts of his subject, but he very rightly only discusses it from the point of view of Regular troops. Even with this restriction there is a vast amount of ground to be covered, whilst it is essential that a work of this kind must be kept within small limits. Good practical advice is all that men need; they will not pay attention to long-winded discussions and illustrations which, when once read for examination purposes, are never likely to be referred to again. Perhaps it is a commendable desire to keep his book terse and practical which has induced Captain Callwell to adopt a style of writing which will scarcely appeal to readers by its elegance. It is possible to be at once concise and attractive, but such sentences as the following, culled at random from the text, are scarcely that: "Commercial enterprise in the end means conquest. Foreign possessions bring military responsibilities in their train and lead to petty warfare. Spain and Portugal in the age of maritime discovery found that it was so. Great Britain, France, and Russia experience it now. The Regular troops detailed for such campaigns enjoy the advantage of knowing whom they are fighting with. They have a distinct task to perform. Skilful leadership can ensure a speedy termination of the conflict." Such aphorisms are perilously near becoming platitudes, and are no more applicable to "small wars" than they are to those larger operations which Napoleon or Moltke conducted. The French and German soldiers in 1870 knew right well with whom they were fighting; they both had a distinct task to perform, inasmuch as one side wanted to get into France, and the other wanted to keep it out. But these are minor matters, which do not in the least lessen the value of what must be regarded as a valuable text-book for those who intend to make the Army and the art of war a profession. The fact that Captain Callwell is an artillery officer of well-recognised ability makes what he has to say on the subject of artillery particularly interesting. In no branch of tactics has so much to be unlearned in "small wars" as where guns are concerned. They cannot be handled as they are on the Continent, or even at Aldershot. There must be less concentration, and the old-fashioned case-shot will often be more useful as a projectile than the "almighty shrapnel," over which Prince Kraft grows enthusiastic. We question, however, whether Captain Callwell will carry many gunners with him when he suggests the advisability of sometimes utilising guns in sections or half batteries. A four-gun battery shoots slower than a six, and two guns can discharge fewer rounds per minute than can four; whilst fire discipline suffers immensely if the whole battery is not under one command. It is because of this that we believe that artillery officers are taught now-a-days never to break up a battery, if it is in any way possible to avoid doing so.

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